VOL. 176 No. 6 JUNE, 1952

AMERICAN Gas Journal

JUL 28 1952

JUL 31 1952

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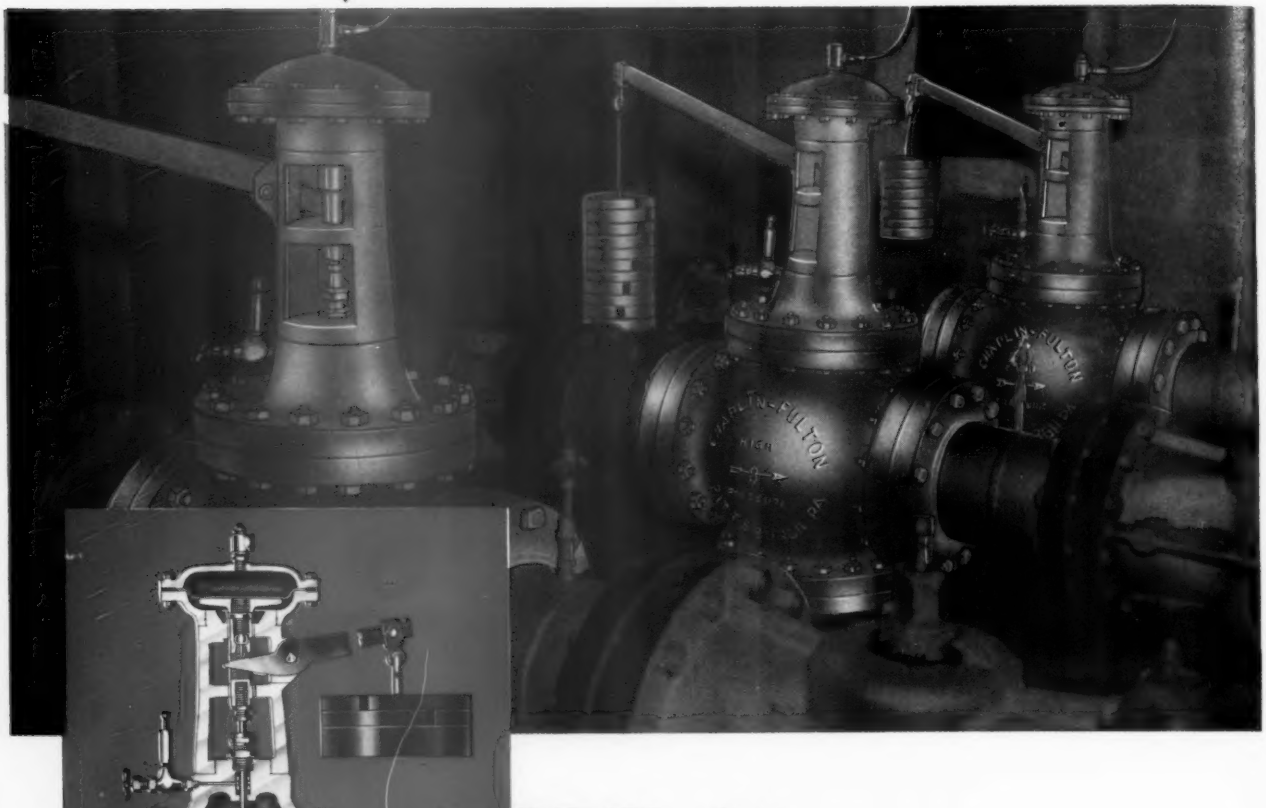

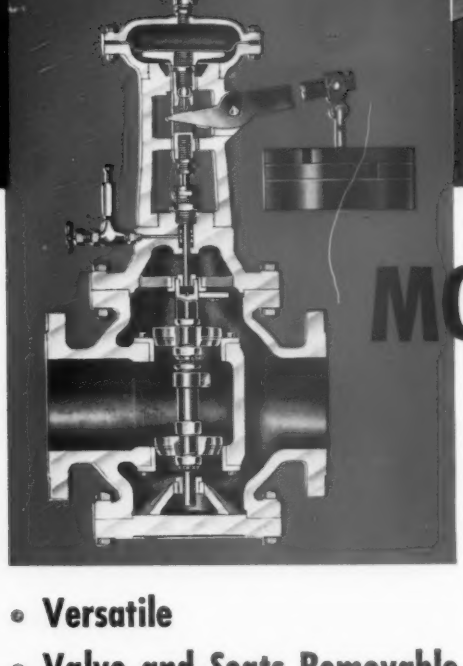

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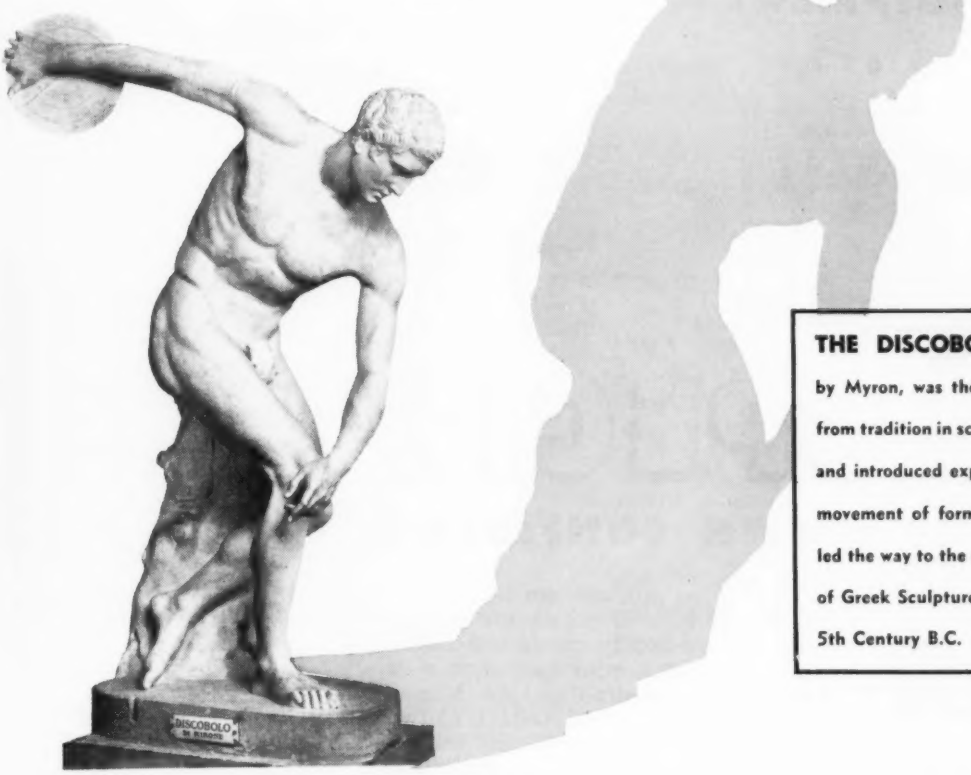

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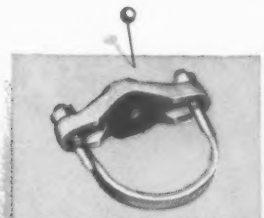
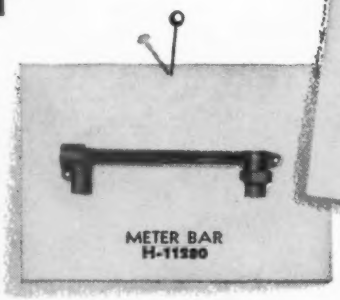
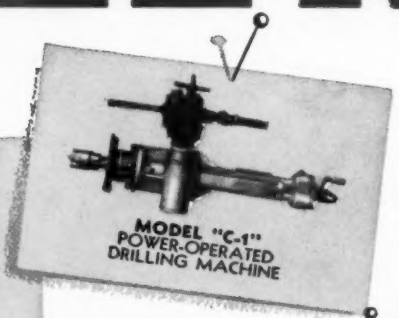

SINGLE STRAP SERVICE CLAMP


METER BAR
H-11280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SERVICE TEE
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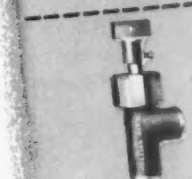
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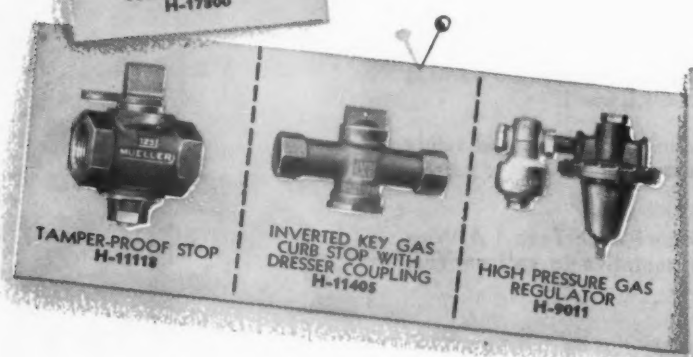
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CURB BOX
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AMERICAN Gas Journal
ESTABLISHED 1859

VOLUME 176 JUNE 1952 NUMBER 6

This month...

Encouraging response to the first appearance of "American Gas Merchandising" in our May issue confirms our original conviction that the need exists in the gas industry for this sort of a central compilation of the best that is available in merchandising and promotion plans affecting the industry. Already we have had requests to make this material available to the gas appliance dealers. We are proceeding on the assumption, however, that the first job is to strengthen and stimulate the interest of the gas companies in merchandising, whether they sell direct or through appliance dealers. The best laid gas appliance promotions fall flat as a goose's foot in areas where the gas utilities are not actively and aggressively merchandising their fuel and the appliances that burn it.

• • •

It has become a frequent, altho by no means commonplace, experience to hear AMERICAN GAS JOURNAL quoted by convention speakers as an authority on what industry policies are, or more accurately what they ought to be. Flattering as this is, it none the less leads us to entertain the horrifying reflection that we may be joining the parade of industry yes men. Nobody quotes an authority that he doesn't agree with.

• • •

With this issue the JOURNAL rounds out 93 years of continuous and uninterrupted publication. July 1952 will mark the beginning of our 94th year. We have had our beard trimmed and are buying a new pair of Congress gaiters to celebrate the occasion.

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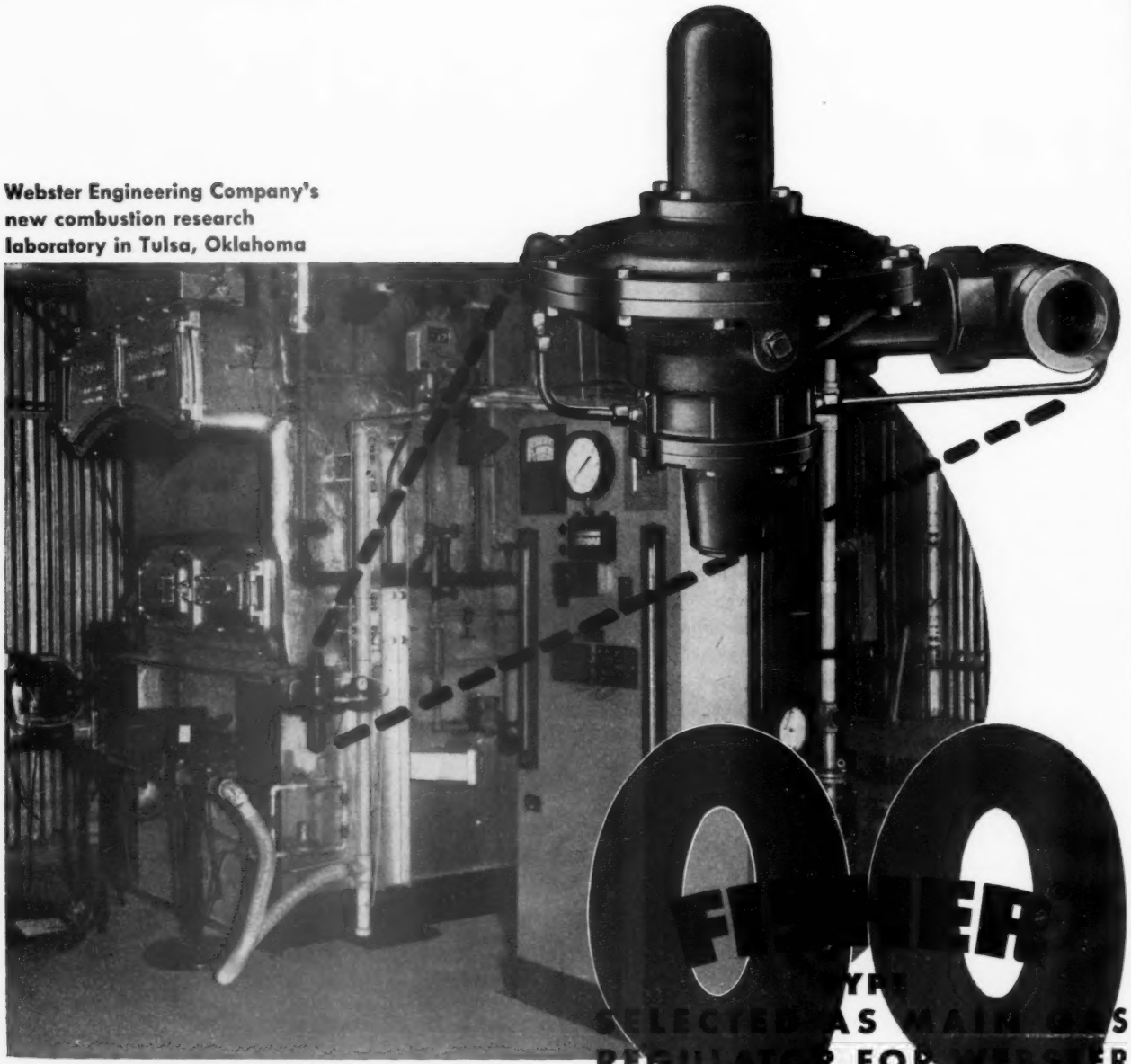
Webster Engineering Company's new combustion research laboratory in Tulsa, Oklahoma



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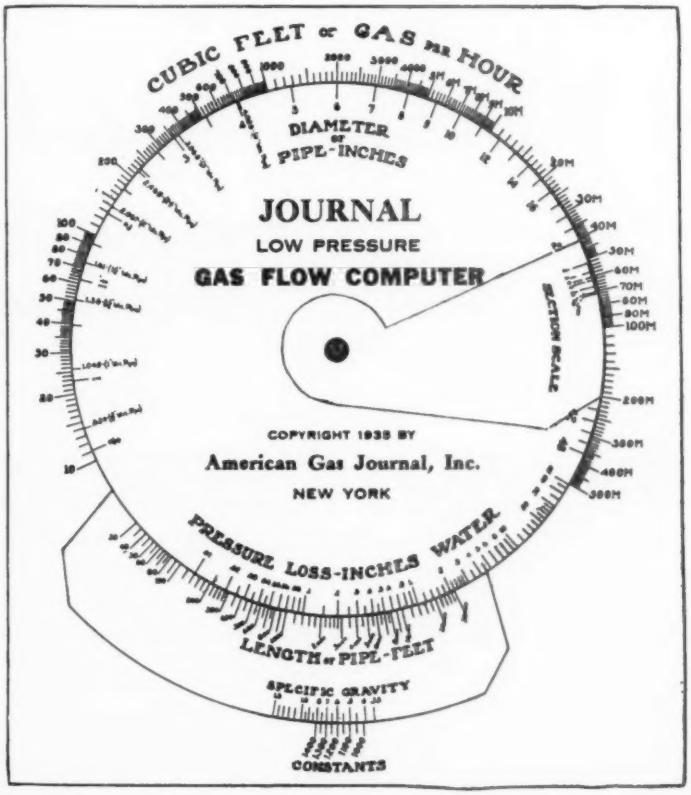

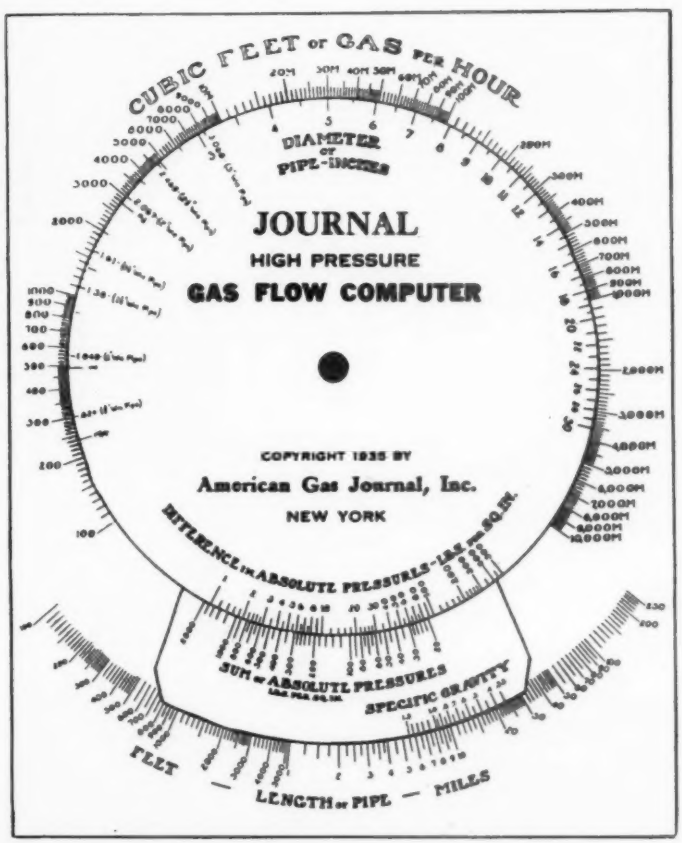

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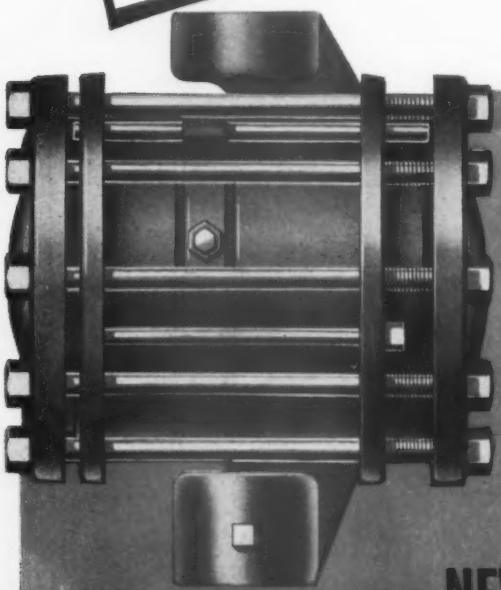

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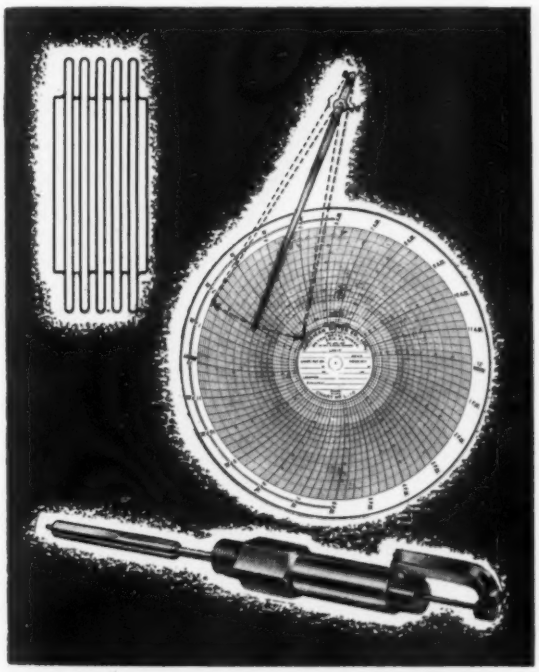

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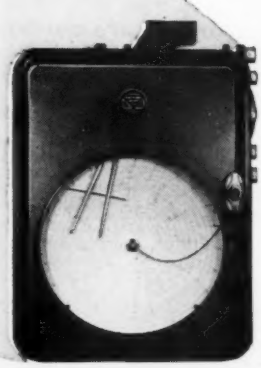

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● Unretouched photograph of a cast iron gas main installed over a century ago by Hartford Gas Company, Hartford, Conn.

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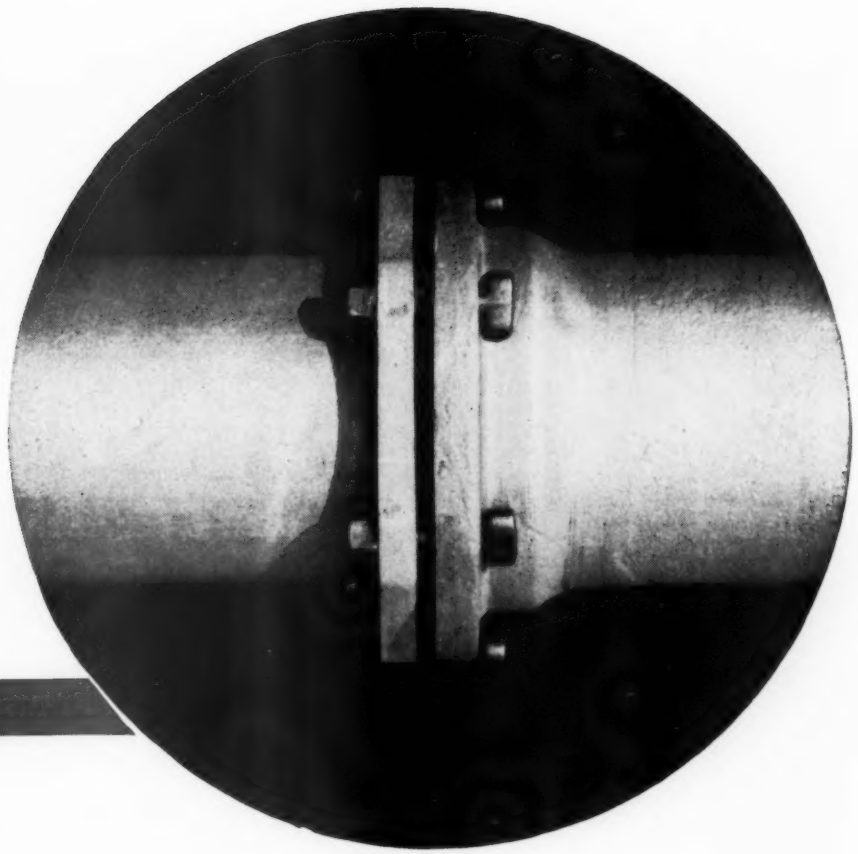
● Many important gas utilities have standardized on standardized mechanical joint cast iron pipe for all types of gas at low, intermediate and high pressures.



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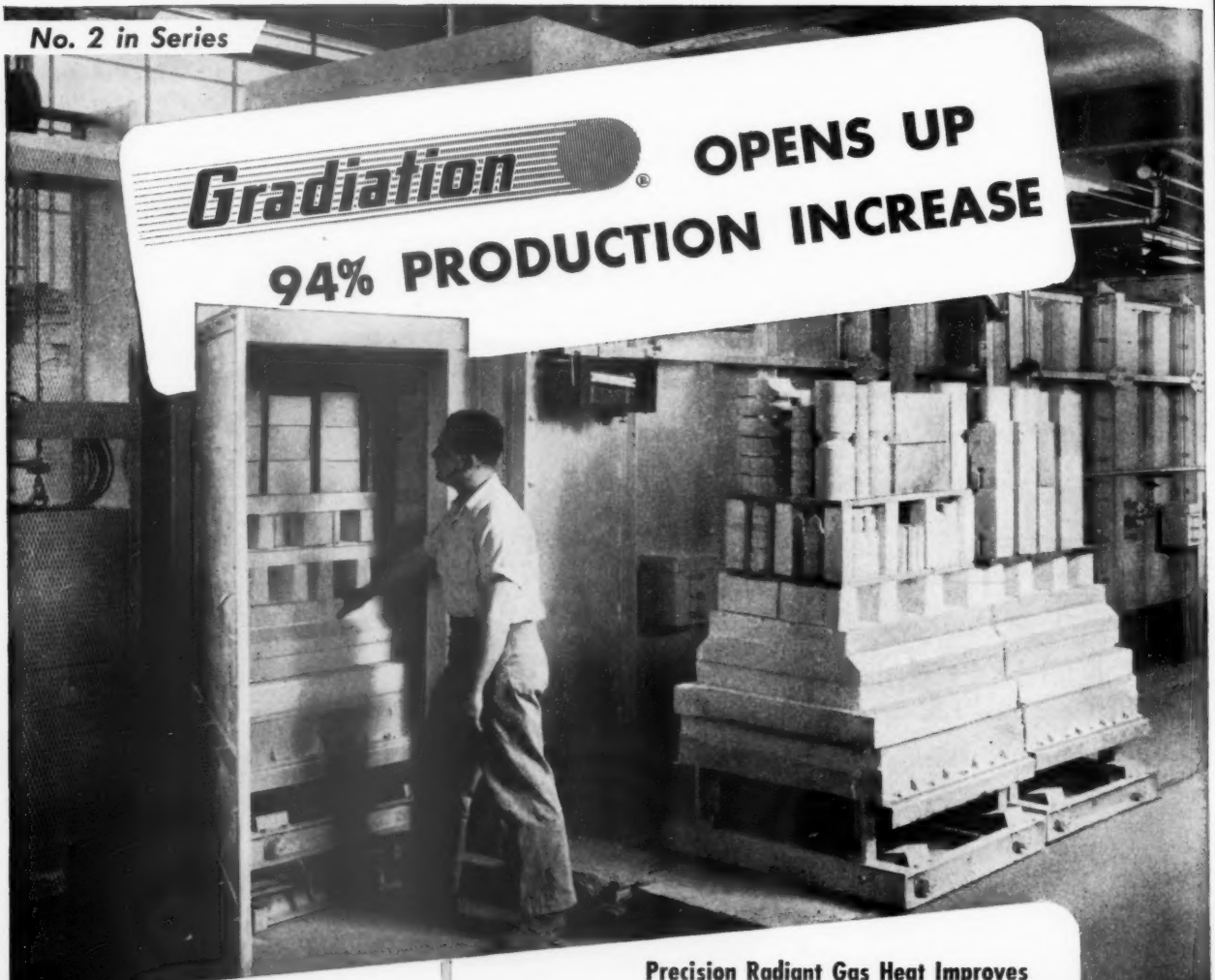

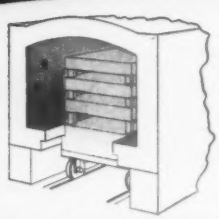

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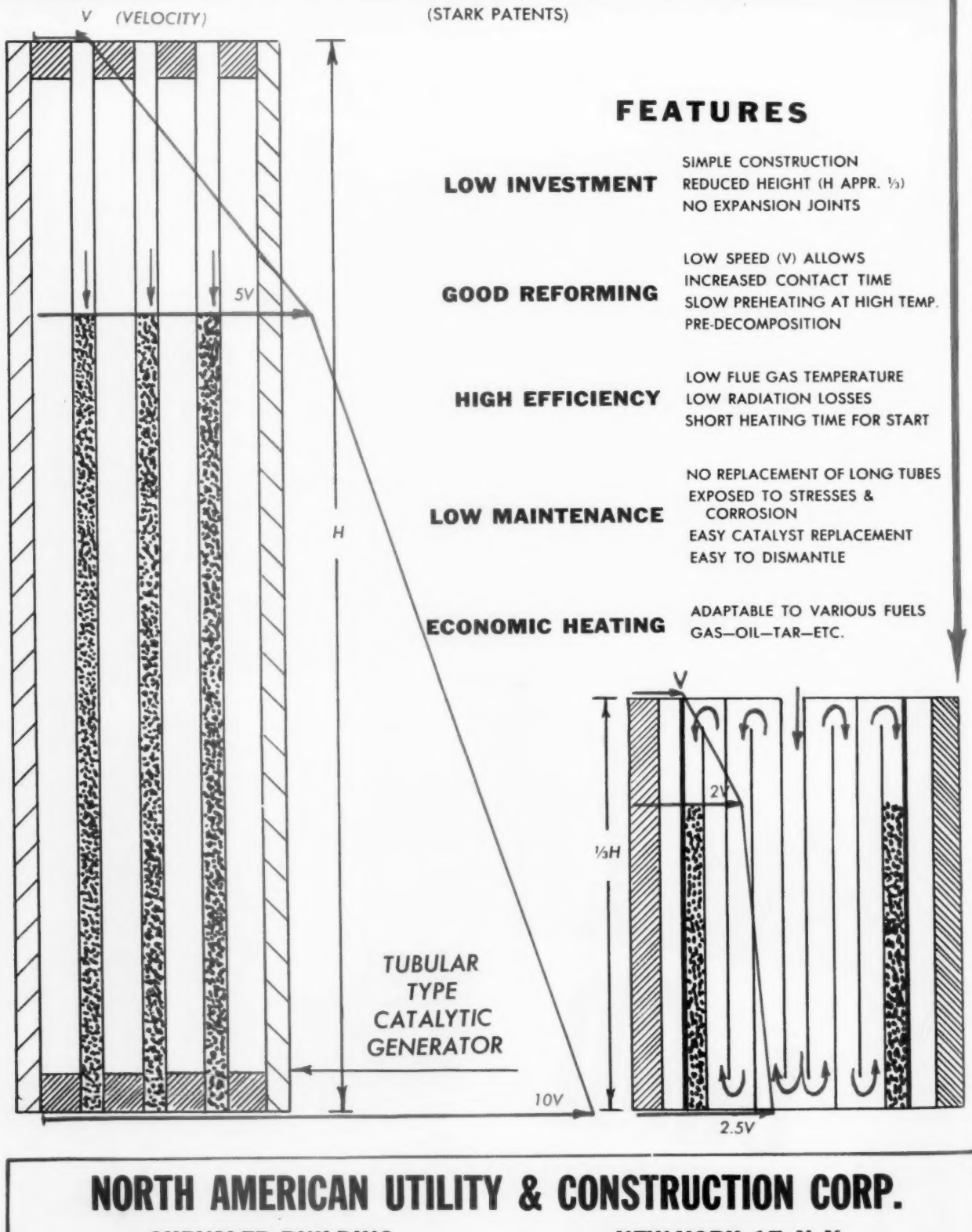
(STARK PATENTS)



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Editorial:

Public Relations—and Industry Need

SOOTHING press releases notwithstanding, the recent meeting of the Gas Appliance Manufacturers Association at Colorado Springs was as close to a knock-down and drag-out affair as that deliberative body has staged in the seventeen years since the manufacturers moved out as a section of American Gas Association and set up shop as an independent trade organization of their own.

As is often the case when dissention is in the air, some of the noisiest and most voluble criticism was directed at administrative and procedural details that the Board of Directors can be expected to take in its stride. But the deep-seated dissatisfaction from which these expressions stem cannot be dealt with superficially.

The greatest single item of intramural contention in GAMA is unquestionably its public relations program, with champions and opponents of that activity in violent controversy on almost every count. Whether or not the program will survive the assaults made on its methods and objectives rests, at this writing, with the association's directors.

Basically, we believe that much of the internal criticism of GAMA's public relations program stems from a confused conception of the difference in function between *public relations* and *publicity*. Despite the fact that the plan was labelled and presented to the manufacturers as public relations, it was designed and operated so as to constitute a combination of the two services, a duality that may well prove to be the fatal flaw in its conception.

Public relations is by nature broad in its approach and subtle in its execution. Publicity plays its part in the advancement of a public relations activity, but the success or failure of the larger objective cannot be measured in terms of free lineage wrangled from the newspapers and magazines, or by press agent stunts cooked up for the promotion of some specific product. Public relations aspires to build an atmosphere of cordial relations and understanding between an industry, or a company, and the public. Its first premise is that one who aspires to win public esteem must be prepared to earn it through the policing of his own policies and actions in conformity with the public interest.

Publicity, on the other hand, is a much more tangible activity. It concerns itself with putting a name or a product or a service before as many people, under as many guises as it possibly can. Publicity also has its function in building good will, but its primary concern is to stimulate interest, desire and action in behalf of its sponsor.

Therein lies the basis for the unrest in GAMA over its present program. We are convinced that most manufacturers are more concerned with appliance publicity than they are over the broader and less tangible aspects of gas industry public relations. They contend that the public relations aspect of the program was in reality pursued in behalf of the gas utilities and not in the particular interests of the appliance industry.

We believe that there is validity in this criticism. But, in fairness, it should be pointed out that where GAMA arrogated to itself the status of spokesman for the gas industry, it did so because in many immediate and urgent situations no other spokesman for the utilities seemed disposed to raise a voice. Whether or not it was a thankless task, the fact still remains that the GAMA program did devote a great amount of attention to a job that should have been done by AGA.

The time has come when GAMA and AGA would both do well to define, in the interests of clarifying their joint and several objectives, just what spheres of influence each proposes to cultivate in the public relations field. The delineation and definition of these spheres might well encompass not only public relations and publicity, but merchandising and promotion as well. In both associations there has been too much personal preoccupation by individuals over their staff jobs and not enough broad consideration of those problems that are mutual to the two industries.

Leaders of both groups are agreed that the time has come when there must be a closer coordination of all activities affecting the public.

The method of operation under which this coordination is to be effected has yet to be decided. Ideally there seems to be no valid reason why a public relations program on behalf of the entire gas industry and a publicity campaign for gas and gas appliances should not go hand in hand. Certainly it must be apparent that both endeavors have to be handled professionally, and by experts who know the technique, just as the GAMA activity has been handled during the past year.

There can be no doubt that the present position of both the gas appliance and the gas utility industries is one that requires a coordinated and an infinitely more vigorous attack on their mutual problems. If it be true that GAMA public relations in the past have encroached on the field that rightfully belongs to the utilities, then the utilities' answer must be to assume that responsibility themselves. If the majority of GAMA members want a program in which publicity predominates, let them by all means concentrate on publicity.

But regardless of how the jobs are to be parceled out, one thing is certain: There is more work to be done for gas and for gas appliances in the immediate future than has ever been done in the past. Anything even remotely resembling a cessation of activity, now, can and would be nothing short of tragic for the appliance and utility industries alike.

Elliott Taylor

Safety is Emphatic in Design and Operation of Georgia Peak Shaving Plant

by G. J. Tankersley
Engineer
Gas Light Company of Columbus

THE MOST PRACTICAL location for a propane-air plant, from an operational point of view, is often not the most desirable from the point of view of isolating propane storage from congested areas.

Such was the case with Gas Light Company of Columbus when it was found essential to construct a peak shaving facility. The only logical location for the plant was in the number one fire area of the city, and approval for construction of the plant at this location was obtained from the state and the city fire marshal, only after the company had presented plans for maximum safety in storage of propane and operation of the plant.

The plant is bound on the west by a river, on the north by other property owned by the company. South of the plant is property owned by the local electric utility, in a state of good housekeeping with no inflammable material. Seventy feet separates the nearest propane storage tank from the electric utility's property. To the east of the plant, there is a 90-foot street which would act as a fire break.

Two blocks away, to the east, is the major business district of the city.

The eight 30,000 gallon (water capacity) tanks and propane-air production buildings are enclosed by seven foot fences and walls. No other company activity is allowed within the fence enclosure. This procedure serves to keep personnel, other than those directly assigned to operate and maintain the plant, completely away from the storage area. This rule of permitting only authorized personnel within the plant area is strictly observed and is considered important in eliminating what may be termed an "ignorance hazard." No imflammable material and no vehicles are allowed inside the plant enclosure.

Safety shut-offs and valves

The fittings and piping on the tanks are arranged so that each pipe run serves only one purpose. Each tank has a "vapor in" line, a "vapor out" line, a "liquid in" line, and a "liquid out" line. There are back pressure check valves at the tank couplings of the "in" lines. Both "out" lines have excess flow valves at the tank couplings.

By this method there is a positive shut off in case any of the lines leading to and from the tank are broken or the flow of propane becomes excessive.

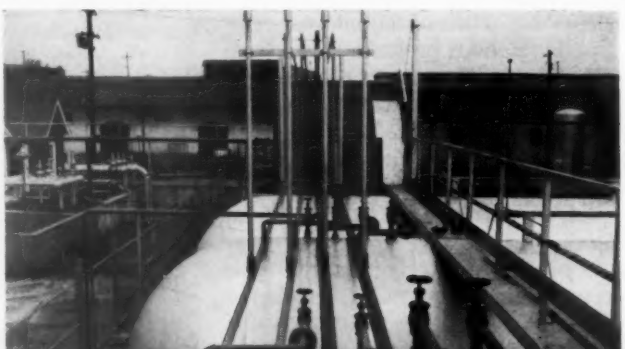
The four lines to and from each of the tanks are connected to four headers (vapor in and out, liquid in and out) for the runs to the plant and unloading station. In each of the four main headers from the tanks there is a "pop off" valve, to release gas that may be trapped in the header under excessive pressure.

Welded piping system recommended

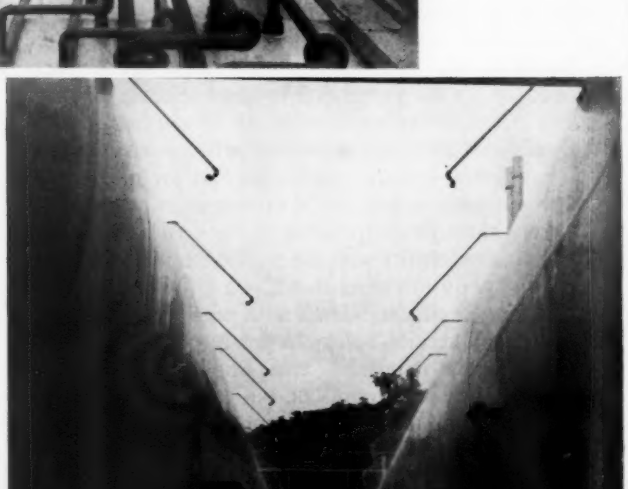
The piping system that handles liquid and vaporized propane and the propane-air is extra heavy steel pipe and is all-welded construction. The welders who worked on this system were carefully screened and were closely supervised. The only leaks that have developed on this system are those where the check valves and excess flow valves were screwed into the tank coupling. Propane liquid and vapors are very difficult to hold with a threaded fitting, and it is recommended that fittings throughout a system of this type be welded.

All piping in the plant is above ground and overhead. This aids in leak detection, plant maintenance and identification. To further aid in identification all pipes in the plant are color-coded. The

(Continued on page 30)



Color-coded piping, adequate manual- and automatic-shutoffs, and fenced areas are some of the safety features of this peak shaving plant.



Twenty-three sprinklers deliver 50 gallons of water per minute to keep tank under blow-off pressure in case of a nearby fire.

New Type of Catalytic Gas Generator Incorporates Economic Features

by Virgil Stark
President
North American Utility & Construction Corp.

CATALYTIC cracking is of interest not only to gas utilities for the reforming of natural gas, propane, refinery and coke oven gases to obtain a gas interchangeable with manufactured gas, but also to the chemical industry for the production of hydrogen and for other catalytic processes producing chemicals.

Examination of the characteristics of the tubular catalytic type generator revealed the following phenomena, inherent in this type:

The type of catalytic generator commonly used at present, comprises a number of tubes, generally 30′ high and 4″ to 8″ diameter, approximately, and partially filled with catalyst.

The feed, natural gas or other gases such as propane, before entering the catalyst together with steam and, eventually air, is generally preheated in the tubes to nearly the temperature of reforming, for instance 1600°F.

The initial volume of the mixture increases with the rise in temperature. The volume is again increased by reforming. At the outlet, the volume of the reformed gas from catalyst may be ten times the initial volume of the entering feed mixture.

As the tube diameter is constant, available free cross section in the tube remains the same except for the restrictions due to catalyst in the corresponding section. The increase in volume results in a gradual increase in velocity, so that the velocity of the reformed gas at the outlet of the catalyst may be ten times the initial velocity of the feed mixture.

To obtain sufficient contact time with the catalyst at these high velocities, it is necessary to provide the long tubes, approximately 30′.

Even under these conditions, the contact time is relatively short. Higher temperatures for reforming are eventually used to compensate for the short contact time.

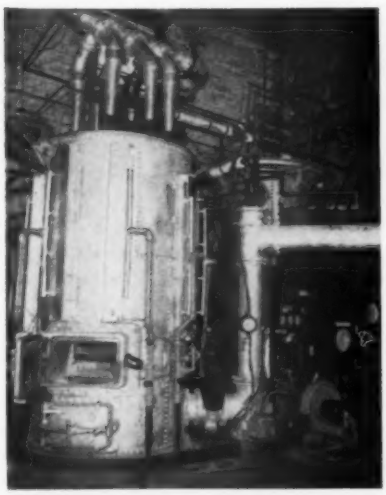
Reduction of investment cost, an increase of efficiency, and other advantages, seemed to be reasonable expectations, if the following could be realized: (a) reduction of gas velocities, (b) diminishing the height of the generator, (c) lowering of combustion and cracking temperatures.

With this goal in mind, a new type of generator to answer those demands was designed and developed.

A number of tests have been made with a catalytic concentric generator installed in the existing carburetted water gas set (5′) in Claremont, N. H., shown below.

The generator used for the tests is supported from the top and expands freely at bottom. The reformed gas, after having passed a tubular spray cooler, is measured by a Roots-Connersville meter. A Cutler-Hammer thermeter registers the heat content of the reformed gas and a Ranarex shows the specific gravity. A Foxboro proportioning control for propane, steam and, in some cases, air was provided. A Bristol pyrometer control maintains the desired temperature in the combustion chamber. Pyrometers indicate the temperature at the outlet of the catalyst section (T3) and in the intermediate sections (T2 and T1). Commercial propane was used for feed and heating.

A number of analyses of the reformed gas made by New York Testing Laboratories, Inc., are shown in the table for different conditions. Different steam and air proportions were used during such tests.



Catalytic concentric generator installed in water gas set at Claremont, N. H.

The tests showed that at temperatures approximating 1,400°F, propane was reformed almost 100 per cent in some tests. No free carbon was found in the gas.

The concentric catalytic generator is composed of concentric cylinders, with free spaces for expansion at the top or at the bottom. The product to be reformed, together with steam and eventually air, is introduced in the central cylinder (E) and passes from one space to the other between the concentric cylinders. The cylinder that has the largest diameter, which is the last one in the gas passage, is heated from the outside either by radiant or tunnel type burners.

In the space between the cylinders (A and B), a catalyst is placed up to a certain height. Desirable consecutive temperatures before catalyst section, suitable to the products to be treated, can be obtained by designing adequate distances between the cylinders, controlling the combustion temperature and varying the free height upstream of the catalyst.

The parts exposed to higher temperatures, such as cylinders A, B and top and bottom plate, are fabricated of stainless steel; the other parts of carbon steel.

Since the feed mixture is heated gradually, its volume increases gradually but the space available between the cylinders also increases gradually. In this way the velocity does not increase rapidly.

The velocity of the feed mixture entering the catalyst and in the catalyst section is low. Even with a low height of the generator, this allows a sufficiently long contact-time and good reforming at lower temperatures.

Pressure losses are low, because of the shorter passage, initial pressures of the feed mixture are required. If air is used, compression costs are reduced.

The catalyst in this generator does not entirely fill the total height of the last section, between A and B, so that a space (H), upstream of the catalyst re-

mains available to facilitate the transfer of heat to the inside cylinders.

As the heat transfer in H is much higher than in the portion filled with catalyst, the temperature in the intermediate sections will depend on the size of the free space in H. In this way, the temperatures in the sections before the catalyst can be changed for a given unit by using more or less catalyst.

The catalyst can be filled easily from the top, in opening P, and emptied at the bottom, through removable plates M.

The whole unit can be dismantled by lifting the cylinders, welded together at the top cover.

Expansion joints can be avoided, as each of the cylinders in the interior of the generator can expand freely, some at the top and others at the bottom.

The whole generator can be supported from the bottom and can expand freely at the top. For small units, the generator can be supported at the top and expand freely at the bottom. This was done in the pilot unit.

Control apparatus provide automatic control of temperatures in the combustion chamber, and for the automatic mixture of the feed gas with steam and air. The reformed gas can be quenched and cooled by water sprays provided in a decanter located at F, in the lower part of the generator.

The catalytic generator may be installed in an existing carbureted water gas set. The height can be made as desired, but is generally 10′ to 12′. For larger capacities several concentric units would be combined in one furnace to reduce investment costs.

As the temperature in the combustion chamber is low, the losses in the flue gas of lower temperature should be relatively low.

The radiation losses will be reduced as a result of lower height and smaller outer surface.

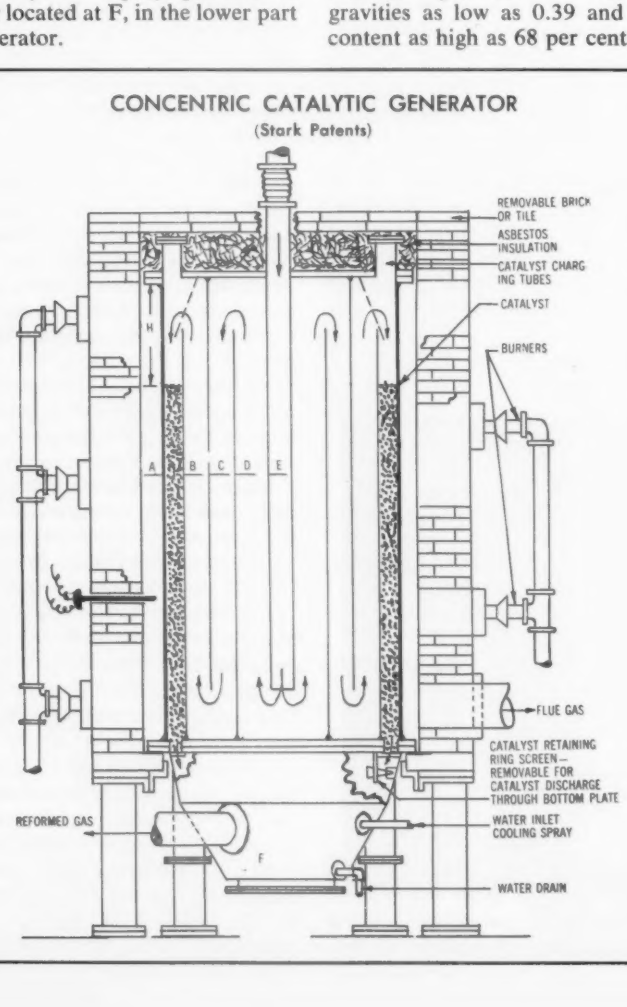
The generator can be heated with heavy oil, which may be a cheaper fuel, and owing to the inherent thickness of the shell there would be better resistance to possible corrosion from sulphur in flue gas.

The maintenance is expected to be low in view of the low combustion temperatures, reduced firebrick lining, absence of expansion joints, reduced height and thickness of catalyst mass.

The reforming process in the generator is continuous and the specifications of the reformed gas constant. The reformed gas does not require purification. As the proportions of reforming with steam and air can be largely varied the reformed gas can be obtained with gravities as low as 0.39 and hydrogen content as high as 68 per cent.

CONCENTRIC CATALYTIC GENERATOR

(Stark Patents)



The feed mixture, before entering the catalyst mass, is preheated to the reforming temperature by travelling at low speed and long contact time with the intermediate cylinders. The temperature is high at the entrance to the catalyst mass, allowing good reforming at lower temperatures in the catalyst.

The generator lends itself, if desired, to a process change in such a way that the decomposition of the feed can be achieved before entering the catalyst mass.

The higher hydrocarbons C_3 cuts, and higher, could, at selected conditions of temperatures, velocities and contact time, and in the presence of excess steam, change to lower cuts, such as C_2. Investigations by others have shown that propane (C_3H_8,) at approximately 1200°F, can decompose without catalyst and without carbon formation in ethylene and methane—$C_3H_8 = C_2H_4 + CH_4$, or $2\,C_3H_8 = C_3H_6 + C_2H_6 + CH_4$, propylene, ethane and methane.

Propylene (C_3H_6) with steam (H_2O), at such temperatures, can produce isopropyl alcohol $C_3H_6 + H_2O = (CH_3)_2CHOH$ which decomposes in ethane, CO and H_2 $(CH_3)_2CHOH = C_2H_6 + CO + H_2$.

The possibility of these reactions was confirmed by analysis of samples taken during tests from the middle sections which showed a high percentage of ethane when commercial propane was used as feed, under certain conditions.

As the gas in the section prior to the catalyst has a higher heat content per cubic foot, it can be partly withdrawn and used for enriching the low heat-content reformed gas, so as to obtain a gas of desired heat-content kept at constant conditions by automatic enriching control.

It appears that the advantages of the concentric catalytic generator are:

It allows reforming at low temperatures with long contact time and relatively high inlet temperatures in the catalyst mass;

Higher efficiencies may be realized because of relatively low losses of flue gas and reduction of radiation losses through the low temperatures and reduced height;

Low investment and maintenance cost;

Short starting time and fuel saving;

Easy maintenance and operation with fewer chances for interruption for replacements and repairs.

The pilot plant installation appears to indicate that the original goal has been reached, and that the new type of cracking generator may play its part in further modernizing the technology of gas reforming.

Courtesy and Respect for Landowner Held Essential in Pipeline Right-of-Way Work

IF, as has been said by someone, the "soft answer turneth away wrath," it seems that some pipeline companies' land and right-of-way departments believe in "courtesy avoideth wrath."

The AGA natural gas department spring meeting program included a duo-presentation by two veterans, B. K. Dunshee, manager, land department, Pacific Gas and Electric Company, and H. I. Putnam, head of right-of-way, Texas Eastern Transmission Corporation, who viewed their problems with full respect to the interests of both pipeline companies and landowners in a manner that does not anticipate any appearances of shotguns.

[There are some public impressions of rights-of-way in the "Saturday Evening Post" of May 24. An article, "They Can Throw You Out Any Time," was written by Craig Thompson, ". . . who had some land eminent-domained away, tells how it works."—ED.]

"One of the reasons I enjoy this right-of-way business," said Mr. Dunshee, "is that you meet so many nice people."

The first reaction of landowners, on being told of the pipeline company's plan, is that "we are invaders and interlopers," he explained. The landowner does not want any part of the pipeline; he wants to be left alone.

How that opposition can be reversed and the right-of-way obtained; how the more important friendship of the people can be gained and retained for the years of pipeline operation was the complex question that Mr. Dunshee and Mr. Putnam discussed from their own experiences.

Courtesy—respect for other fellow

"If the answer to these questions can be expressed in one word, the word is 'courtesy,' " said Mr. Dunshee. "Not mere politeness, but the true courtesy which is made up of understanding consideration and wholesome respect for the other fellow and which begets the same treatment from him.

"Such courtesy will include fairness and honesty, but does not preclude a hard-headed analysis of the economic and human factors involved and a correspondingly shrewd negotiation."

The first interview with a landowner may set the tone of the relationship, he continued, and if it is successful, the pipeline company's representative will not only obtain the permission he seeks but may develop the owner's attitude into a desire to become a part of the dramatic project.

"If the engineers will follow through," he continued, "by discussing, with discretion, some of the location problems facing them and by seeking advice on such details as ground stability and flood flows in the streams, they may succeed in demonstrating to him what we know to be true—that the impersonal and presumably heartless corporation of which he has heard is composed of ordinary fellows sincerely trying to do a job."

Mr. Putnam commented, realistically, that "in the past, a ruthless policy was frequently followed by pipeline construction crews and the hangover of ill-will developed from some of those construction jobs still plagues the areas where they occurred."

Uniform prices

With respect to prices paid for right-of-way, Mr. Dunshee emphasized that "it is fundamental that the prices paid be well-thought out in advance and that they be uniform for like lands similarly affected. There is no more prolific source of trouble than a spotty price structure. We will lose the respect of the man to whom we pay too much and gain the distrust of the one to whom we pay too little. In either case, a healthy friendship has been destroyed."

The right-of-way representative

What sort of person does this job of "making friends and getting rights-of-way," Mr. Dunshee asked.

"He is obviously honest and straightforward, patient, considerate and resourceful," the description began. "He likes his job because he likes to deal with people. He is a salesman of the highest type who deals with facts and does not employ so-called 'high pressure' techniques. He knows land values, particularly the value of the land on which he seeks a right of way. He can speak authoritatively on the effect of such rights-of-way on the utilization and value of land. He knows within narrow limits what price he can afford to pay and be fair to the company, to the landowner, and to the others along the route of the line. He has reasonably accurate knowledge of his company's methods of construction and operation so that he can clearly inform the landowner how his operations will be affected. He will make no promises that will not be observed. . . .

"I have referred to this man as a salesman. There is one important difference—he must get them all, right down the line. He cannot fill his quota by signing up some business in the next county. . . . He must separate fact from fantasy. He must know intuitively when to listen and when and how to drive for a decision.

Working for the years to come

"With complete confidence in his own ability, believing in the fairness of his proposal, he will be able to apply the compelling power of facts logically, patiently, firmly, but with never-failing courtesy. In the vast majority of cases he will obtain the right-of-way and in the process he will gain the respect and cement the friendship of the owners of the land through which our pipeline will be constructed and operated throughout the years to come."

Cooperation by contractor is necessary

Relations with landowners after rights-of-way have been permitted, and granted in appropriate "simple language, devoid of legalistic words and phrases and without the fine print and all it implies," require the same fine degree of understanding and treatment, according to Mr. Putnam.

"An important feature, and one that can be of great help in maintaining satisfactory relations with people along the right-of-way, is that the contractor doing the construction has, not only proper financial backing and good equipment, but also the construction know-how to stay within right of way limits and personnel indoctrinated at least to the extent that they do not alienate the land owners and other people living along or near the right of way," he said.

"I don't mean that the contractor's employees should bear the responsibility that properly lies with the right-of-way men. At least, however, they should have a reasonable respect for the rights of property of others and should have a de-

(Continued on page 36)

Pipelines Must Share Industry Promotion Natural Gas Meeting Told

IN A MEETING devoted chiefly to the problems of supply, production and transmission of natural gas, 700 members of American Gas Association's natural gas department met in Los Angeles, May 12-13.

Despite optimistic pronouncements on reserves, future markets and steel for pipelines to serve those markets, there was an undercurrent of concern over the ability and determination of the distributing gas utilities to preserve the traditional base load of cooking and water heating in the face of electrical competition.

From the viewpoint of the appliance manufacturer, this was highlighted in an address by Stanley H. Hobson, president, Geo. D. Roper Corp., who said that "until every utility in the United States is back in the merchandising business, on some kind of basis, we will all be working on diminishing returns as 'purists.'" He urged the transmission branch of the industry to scrutinize the end-use of the gas so that the markets they serve may continue to expand.

"Now is the time to stop—look—and listen," Charles E. Bennett, president, AGA, and president, The Manufacturers Light and Heat Company, told the assembled gas men.

"Mounting success always brings with it increased responsibility," he said. "The natural gas business must shoulder a far greater responsibility today than ever before. . . . We gas men have divided into groups, according to our interests and responsibilities. . . . But we must not forget that the public neither knows nor understands our familiar terms. . . . To them gas service is a single enterprise. We must adjust our sights in the same direction—gas is a single responsibility."

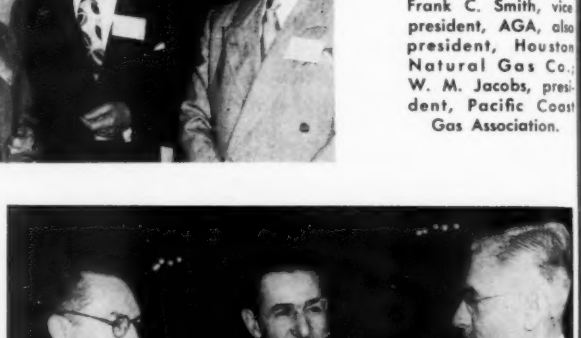
Three responsibilities were held to have "about equal importance" by Mr. Bennett. "They are service—unification and integration—and safety," he said.

Interdependence among producers, transmission companies and distribution companies was considered to be "axiomatic" by Mr. Bennett.

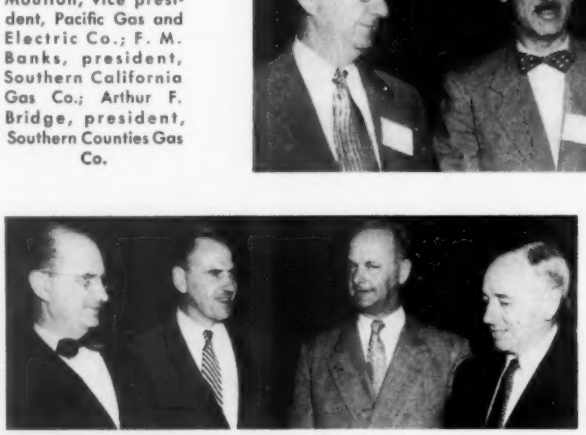
"One good example of current thinking on matters of service," he emphasized, "is the recent Operating Section of AGA appointment of a committee on customer service responsibilities. The goal of this committee is the formulation of a code of service responsibility. Among the subjects of prime interest to this group is the study of service required for safety and for con-

(Continued on page 29)

Left—Eskil I. Bjork, president, Peoples Gas Light and Coke Co.; Charles E. Bennett, president, AGA, also president, Manufacturers Light and Heat Co.; Frank C. Smith, vice president, AGA, also president, Houston Natural Gas Co.; W. M. Jacobs, president, Pacific Coast Gas Association.

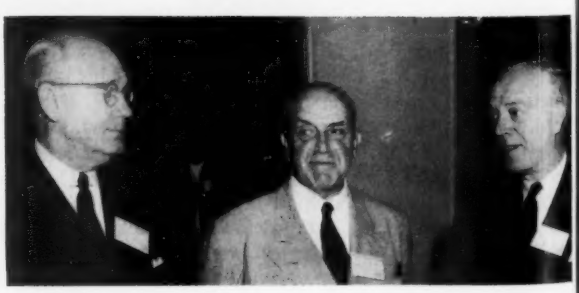


Below—Howard B. Noyes, Petroleum Administration for Defense, also vice president, Washington Gas Light Co.; James S. Moulton, vice president, Pacific Gas and Electric Co.; F. M. Banks, president, Southern California Gas Co.; Arthur F. Bridge, president, Southern Counties Gas Co.



Above—Hall M. Henry, vice president, NEGA Service Corp.; R. J. Rutherford, president, Worcester Gas Light Co.; Harland C. Forbes, executive vice president, Consolidated Edison Co. of New York, Inc.

Left—Edward M. Borger, president, Peoples Natural Gas Co.; Charles E. Bennett; T. J. Strickler, vice president, Gas Service Co.



Above—George S. Young, president, Columbia Gas System, Inc.; Louis Ruthenburg, president, GAMA, and chairman, Servel, Inc.; E. D. Bivens, vice president, United Fuel Gas Co.

GAMA Ponders "Operation Sales"

IN an atmosphere of hard-bitten realism, documented by statistics on the decline in gas appliance sales, the encroachment of electric cooking and water heating on domestic markets once traditionally gas, the inadequacy of the CP range campaign to supply the incentive needed to revive the upward trend of cooking equipment, and the need for a new and more universal promotion to lift gas appliances out of the doldrums, the seventeenth annual convention of the Gas Appliance Manufacturers Association met in Colorado Springs, May 21 to 23.

The three day meeting was divided between general sessions, which all of the 500 delegates, alternates and guests attended, and division and group meetings, where the specific problems of ranges, water heaters, heating equipment, controls and other appliances and equipment were considered.

Henry H. Fowler, administrator of the National Production Authority, addressing the President's Dinner honoring Louis Ruthenburg, chairman, Servel, Inc., and retiring head of GAMA, predicted substantially relaxed controls of most materials which are essential in the manufacture of gas appliances and industrial gas equipment.

The convention elected James F. Donnelly, assistant general manager, Permaglas-Heating division, A. O. Smith Corp., president of the gas appliance group. Sheldon Coleman, president, The Coleman Company, Inc., became first vice president. T. T. Arden, chairman of GAMA's Pacific Coast Manufacturers Section, was chosen second vice president, to succeed Donnelly, while Lyle C. Harvey, president and general manager, Affiliated Gas Equipment, Inc. and H. Leigh Whitelaw, managing director of GAMA, were re-elected as treasurer and secretary, respectively.

James F. Donnelly

Operation Sales, a new gas range promotion which is expected to replace the CP range campaign, was the biggest single item of merchandising interest placed before any session of the convention. Operations Sales, as laid before the range division by its chairman, E. Carl Sorby, vice president, Geo. D. Roper Corp., is a broad and comprehensive campaign that will embrace all automatic gas ranges, at any price level, and will aim at an ultimate goal of five million automatic gas range sales a year. The tentative budget for the first year was set at $406,000.

In urging on the division the necessity for such a campaign, Mr. Sorby pointed out that the 1951 sales of electric ranges were 300 per cent above the prewar average, while gas ranges have remained about even. Electric ranges in comparison to gas have advanced from a ratio of about one to five in 1940 to one to 1.7 in 1951.

Plans for launching Operation Sales, include an advertising and promotional appeal to wives, mothers, prospective brides and teen-agers.

The program will be aggressively merchandised to dealers and utilities, Mr. Sorby said. This will be accomplished through trade paper advertising and through reprinting of key consumer advertisements for distribution by dealers and salesmen. Newspaper mats, in addition to direct mail pieces and envelope stuffers, will be furnished for gas company and dealer use.

A back-to-the-home campaign, enlisting the support of home service directors in encouraging kitchen modernization, and a school program to modernize home economics school laboratories, were described as vital parts of the automatic gas range drive.

Other details of the program include an advertising and direct mail approach to architects, builders and real estate managers, instruction for salesmen on new ways to sell modern gas ranges, improvement of installation and service manuals and films, and group participation by manufacturers in home shows.

A total of seventeen manufacturers, said to represent over 60 per cent of the Nation's gas range production, voted unanimously to approve the program. The board of directors of GAMA will decide the fate of the CP campaign.

Following an analysis of the association's finances by Treasurer Harvey and a report of the nominating committee by E. Carl Sorby, the first general session of the convention heard Arthur S. Goldman, of *Architectural Forum*, describe the recent relaxation of the mortgage requirements as opening "a new multi-million-dollar market" for gas appliances and equipment.

The same session viewed a graphic report of activities during the first year of GAMA's public relations and sales promotion program. The report, delivered by Gerry Swinehart, president, Carl Byoir & Associates, GAMA public relations counsellors, stressed successful efforts to build gas industry prestige, improve gov-

(Continued on page 29)

Past, present and future met at Gas Appliance Manufacturers Association convention as Harry Gurney (center), former chairman, house heating division, receives a meritorious service award from Louis Ruthenburg, GAMA president, while president-elect James F. Donnelly gives him a pat on the back. Past GAMA president Frederic O. Hess (left) and Henry H. Fowler, NPA and DPA administrator, smile approvingly.

Controllable Gas Equipment Used To Fire Polish Glass Ware

by Robert C. LeMay

THE PURPOSES of fire polishing are well known to glass men—to remove dangerous cutting edges and unsightly mold marks, to smooth grinding marks, to seal incipient cracks and fissures, and to increase surface lustre. The latter objective involves the fusion of broad surface areas, and is generally known as glazing.

Fuel gas and air are used for the purpose whenever available. If employed successfully, ware surfaces are melted and flowed while ware bodies are held sufficiently rigid to maintain shape. This is accomplished by passing hot ware through and in actual contact with gas flames.

As alternate means of securing some or most of the desired results, some plants polish by acid immersion or by brushing with abrasive materials. Only fire polishing, however, will strengthen ware by sealing tiny cracks and fissures. Although least costly of the three, fire polishing as usually practiced is probably the most difficult method to control.

By performing the fire polishing operation just preceding the anneal while ware is at temperatures well above the strain point, where additional thermal strain cannot occur, it is possible to avoid breakage which could be expected at lower temperatures. In the interest of economy, fire polishing is performed whenever possible directly between the hot forming and annealing operations, as soon after leaving the mold as possible.

When there are additional operations, such as cutting or etching, it is necessary to reheat the ware as part of the fire polishing process. As is the case where this operation immediately follows initial forming, ware is transferred directly from fire polishing to the annealing lehr.

Most heavily used in bottle and tableware plants, fire polishing burners—and to a lesser extent machines—are found in a wide variety of designs and operating with all degrees of satisfaction. Operators in general are seeking better equipment for the purpose. Acid shortages, increased production speeds and higher product quality standards are major reasons for this demand.

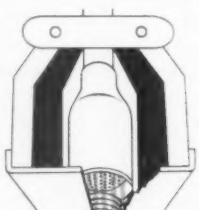


Fig. 1—Fire polishing within the arm that transfers bottles from forming machine.

In the search for better methods, much new equipment has been installed, both purchased and home-made. A fairly high proportion of this has been in turn discarded for something which later promised better results.

In general, during this evolution, handling equipment had been worked out reasonably well. The greatest demand for improvement involves combustion equipment. Recent studies in both laboratories and glass plants have resulted in a new approach, made possible by clarifying basic requirements of the fire polishing operation itself.

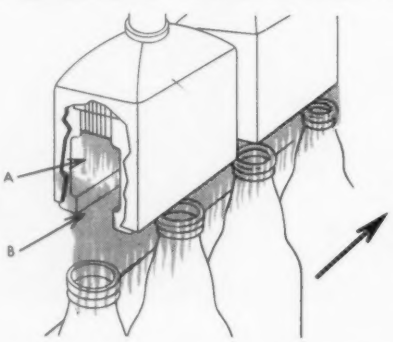


Fig. 2—Bottle mouths being polished during transfer on conveyor from former to lehr.

New Approach to Fire Polishing

The first feature of the new approach to fire polishing requires selection of burner equipment which distinguishes between heating of ware bodies and fusion of edges or surfaces.

Recent studies* of the use of radiant energy in other glass heating operations have clearly shown that glasses which admit radiant energy, including most commonly used glass formulas, are heated internally and externally at the same time, by this method.

Excessive proportions of radiant heat can and often do soften ware bodies in fire polishing operations and cause disastrous loss of shape before surfaces are adequately fused. Laboratory investigation and operating experience combine to indicate burner types which produce surface heating primarily, with a minimum of radiant energy. Radiant heat from incandescent surfaces or luminous flames should be confined to preheating before fire polishing or to annealing afterward. For preheating and annealing, however, significant advantages of controlled radiant heating have been demonstrated clearly.*

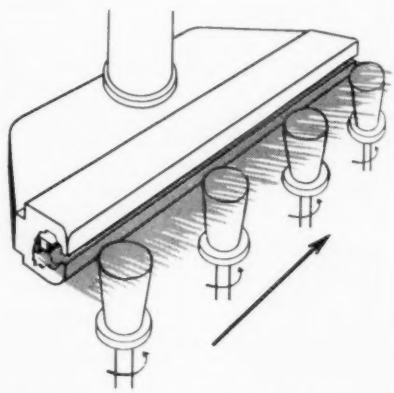


Fig. 3—Fusion of tumbler lips before special flame-retaining ribbon burners during rotary-horizontal travel.

Sharp blue flames emit relatively little radiant energy and do a satisfactory fire polishing job, when handled properly.

The second feature of the new approach requires that burners permit separate and independent control over flame retention and flame quality.

When used with slower burning natu-

This article has been adapted from an American Gas Association information letter. It was prepared by Robert C. LeMay of Selas Corporation of America, who is chairman of the AGA subcommittee on glass-ceramics processing. It was issued by the industrial processing committee.

* "Radiant Heating in Glassworking Production and Equipment," *Bulletin*, American Ceramic Society, January 15, 1950; and "Radiant Heat in the Glass Industry," *The Glass Industry*, July 1951.

ral gas, much of the older burner equipment has required a compromise gas-air

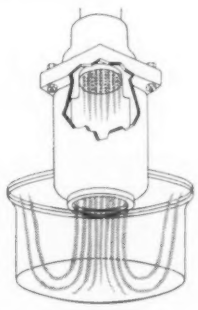


Fig. 4—Glazing interior surface of electric meter case beneath special vertical burner.

ratio adjustment between that which produces the best ware and that which is necessary to keep the flame on the burner. With faster manufactured or enriched gases, compromise adjustment is often required to prevent flashback into the mixture line. Obviously, compromise flame settings can reduce the speed and effectiveness of any heating operation.

The third feature involves control over flame geometry.

Burners should be selected which maintain sharp flames on the edges of the ware that is being fused. The exception to this is the operation of melting overall surfaces for increased lustre.

Confinement of flame shape may be accomplished with standard burners, or burners may be designed specially for a flame that is shaped to the ware.

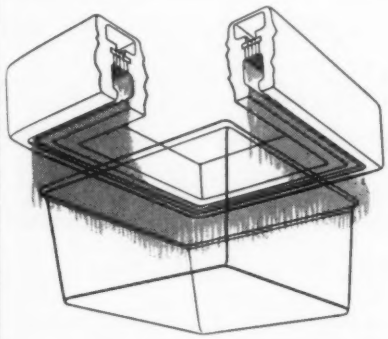


Fig. 5—Fire polishing borosilicate glass with burners shaped to the ware.

The fourth feature involves constant and uniform operation.

This requires equipment capable of maintaining constant but adjustable gas-air ratios and unvarying mixture pressures at the burners. All fire polishing requires blast type combustion and, to be most effective, flame delivery should remain uniform for any one type of ware. For this, combustion shall not be affected by gas and air pressure fluctuations at the point of mixing, or by change in the number of burners attached to a single gas-air proportioning device. Flame-uniformity prevents overheating and collapse of delicate ware on automatic glazing machines. Close control of flame chemistry, air-gas ratios, prevents discoloration of glass, such as that which occurs when lead glasses are exposed to reducing flames.

Fire Polishing Equipment

Most fire polishing is done on conveyorized machines because the larger volume of glassware is machine-made. Many of these machines are portable. Some convey parts horizontally, with or without rotation; much tableware is fire-polished while rotating on traveling vertical spindles.

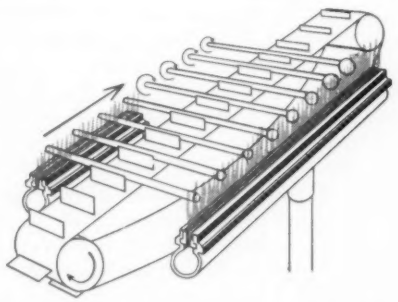


Fig. 6—Time of flame exposure determines whether glass rod end is smoothed or formed into a ball.

Some Fire Polishing Operations

Beverage Bottles. So many drinks are taken straight from the bottle that both inner and outer edges of bottle tops must be freed from sharp edges to protect the customer. In many plants, these are finished by a small round burner firing down on the bottle top from its position in the transfer arm, during removal from forming machine to conveyor. See Figure 1. Burners usually are of the multiport type, slightly larger in diameter than the bottle top. Actual burner ports are molded in ceramics or formed from alloy metals for heat resistance, and some form of flame retention is provided.

When all bottles from one machine are the same height, stationary lines of burners may be used to play down upon the tops from above as they pass beneath on a transfer conveyor. See Figure 2. Flame retention is provided adequately by burning the gas within chamber (a) and discharging it through mouth (b) as very hot combustion products.

Table Tumblers. Table tumblers require fire polishing along the top edge, for safety, and to fit caps if the ware is marketed as a food container. In one process a bead is formed along the rim while blown tumblers are being burned off the moiles. In other cases a separate fire polishing operation is required.

Figure 3 shows tumblers passing in front of a newer type ribbon burner for this purpose, on rotating spindles. Multiple burners are normally required, and may be placed at both sides if structure permits.

Hollow Pressed Ware. Certain items are glazed from above; among these are electric meter cases and glass blocks. These have nearly smooth surfaces, which are clarified very satisfactorily and made lustrous by blasting downward from single high-input, not high velocity, burners. See Figure 4. The ceramic-lined combustion chamber solves the problem of flame retention and minimizes flame-spill.

Baking Dishes, Cups, Refrigerator Dishes. These are nearly always pressed and then fire polished along top edges. In one installation, burners and flame patterns are matched to ware top contours, round or rectangular. Beneath the specially shaped burners, firing downward, ware is indexed from one burner to the next. See Figure 5.

Plate and Platters. A leading producer of hand made ware glazes in a unique but effective manner. Ware is preheated during rotation under an individual radiant burner roof, then transferred and rotated again beneath a roof sending down a controlled pattern of sharp blue flames for surface fusion.

Articles Formed from Rod, Tube and Sheet Glass. Fire polishing of these materials usually consists of removing sharp cut edges, frequently by rotating pieces in flame. This can usually be done with simple burner equipment, using blast tips, fish-tail tips or ribbon burners playing on the edges. See Figure 6. In this operation, the length of the flame exposure controls the diameter of the ball on the end of the rod.

As natural gas lines have reached into new industrial areas, glass plants there have in numerous cases experienced difficulty in maintaining performance of fire polishing operations, due to slower burning speeds than with manufactured gas and air.

Slower combustion of natural gas and air results in larger flames with the same Btu and air input, because more time and space are required for it to burn. Cycle time for heating by flame contact may be increased approximately ten per cent.

Heating speeds may be restored in some cases by employing combustion equipment of new design. Plants that have found it undesirable to change all burner equipment have enriched natural gas with hydrogen or combustion air with oxygen. Either method will restore combustion speeds; selection is a matter of economics. Hydrogen is being added, satisfactorily and automatically, in proportions of twenty to thirty per cent, through motor-driven mechanical mixers. See Figure 7. Oxygen is usually introduced through suitable inspirators placed close to the burners.

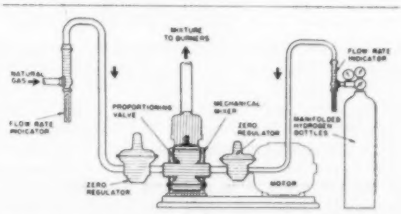


Fig. 7—A mechanical mixer for enrichment of natural gas with hydrogen.

Favorable Bond Market

by John F. Falvey
Financial Editor

FOR MOST of the past month the stock market has been in practically a state of somnolence. How lethargic it has been is shown in the fact that the average yield on the various stocks comprising the AMERICAN GAS JOURNAL index changed only one per cent during the month. Trading volume, furthermore, contracted sharply.

In its lack of action, the market has been reflecting the indecision of investors who have been trying to weigh prospects for the market in view of the recent decline in corporate earnings, the prospect of continuing inventory losses, the outcome of the government seizure of the steel industry, and the uncertainty in general currently prevailing.

All indices reveal a decline in corporate profits for the first quarter of this year, differing only in degree. Although the Council of Economic Advisors had estimated that corporate profits in the first quarter were down almost twenty per cent from the identical 1951 period, all other yardsticks—based on actual earnings experience—showed the decline to have been considerably less serious, aggregating anywhere from seven to thirteen per cent.

The discrepancy between the Council's estimate and the actual results is traceable to the action of the companies in revising their comparative 1951 first quarter returns to reflect the tax increase which went into effect late in the year.

Bulking large in the corporate earnings experience was a substantial total of inventory losses which are estimated to have cut profits in the first quarter of this year by annual rate of $1.2 billion, in contrast to the $8.9 billion annual rate at which inventory *profits* were running in the comparable 1951-period. Elimination of the effect of inventory profits and losses would have permitted actual increase in corporate earnings in the initial three months of this year.

Despite the not-too-favorable earnings showing, however, the total of dividend payments has remained high. Stockholders received approximately six per cent greater return in the first quarter of 1952 than they did in the corresponding period a year ago, according to figures released by the Department of Commerce and the New York Stock Exchange.

According to "The Exchange," official publication of the New York Stock Exchange, higher dividends were paid on 236 issues in the first quarter of this year while 61 were lower and 26 either omitted payments or changed their distribution dates so that they did not fall within the initial quarter. It is significant that the number of dividend reductions remained unchanged from earlier estimates, whereas the number of dividend increases nearly doubled those indicated earlier (AMERICAN GAS JOURNAL, May 1952).

Utility earnings top others

The earnings experience of the utilities was far better than for corporations as a whole, since their profits in the first quarter were up 9.7 per cent; even though rising costs may combine with slow action of regulatory authorities in granting compensatory rate increases to offset these rising costs, the industry should be able to show further gains in the months ahead.

A recent prediction made by the Joint Committee on Internal Revenue is that corporate profits before taxes this year will aggregate $44-billion. Realization of this estimate would bear out investment firm predictions that corporate profits after taxes this year would be about $17-billion, for a decline of only about five per cent from the $18-billion corporate

Index of Yields : Selected Utilities Stocks

	May 1952	Apr. 1952	Mar. 1952	Feb. 1952	Jan. 1952	Dec. 1951	Nov. 1951	Oct. 1951	Sept. 1951	Aug. 1951	July 1951	June 1951
Natural Gas Transmission Companies	4.05%	4.08%	4.03%	4.36%	4.32%	4.50%	4.51%	4.67%	4.67%	4.65%	5.07%	5.26%
Natural Gas Transmission & Distribution Companies	5.32	5.34	5.14	5.29	5.17	5.33	5.30	5.36	5.09	5.11	5.24	5.30
Manufactured & Mixed Gas Companies	5.06	5.13	4.99	5.18	5.05	5.25	5.36	5.32	5.43	5.46	5.52	5.22
Class "A" Electric Companies	5.54	5.65	5.51	5.61	5.53	5.80	5.78	5.83	5.74	5.69	5.97	5.95
Class "B" Electric Companies	5.57	5.61	5.48	5.70	5.64	5.76	5.82	5.78	5.74	5.78	5.86	5.88

Method of Compiling Index of Yields

This is a straight arithmetical index of comparative yields obtainable on a selected group of gas and electric utility industry common stocks.

The companies comprising this index have been selected by the AMERICAN GAS JOURNAL as providing a representative cross-section of each industry, from the standpoint of geographical diversification and of the relative importance of the individual companies in their areas.

No effort has been made to weight the average to give effect to changes in capitalization or in dividend rates because the yields afforded on the issues reflect such changes. The index is designed to show the rate of return and not necessarily market movements on the stocks comprising it.

The companies used in compiling this index are:

Natural Gas Transmission Companies: El Paso Natural Gas Co.; Northern Natural Gas Co.; Panhandle Eastern Pipe Line Co.; Southern Natural Gas Co.; Tennessee Gas Transmission Co.

Natural Gas Transmission and Distribution Companies: Columbia Gas System, Inc.; Consolidated Natural Gas Co.; Lone Star Gas Co.; Oklahoma Natural Gas Co.; Pacific Lighting Corp.

Manufactured and Mixed Gas Companies: Bridgeport Gas Light Co.; Brooklyn Union Gas Co.; United Gas Improvement Co.; Peoples Gas Light & Coke Co.

Class "A" Electric Companies: Boston Edison Co.; Commonwealth Edison Co.; Houston Lighting & Power Co.; Southern California Edison Co., Ltd.

Class "B" Electric Companies: Dayton Power & Light Co.; Hartford Electric Light Co.; Pennsylvania Power & Light Co.; Public Service Co. of Colorado; San Diego Gas & Electric Co.

et fility Issues is Indicated

net income reported last year. It also would lend strength to the expectation that dividend rates will be well-maintained and that managements will be able to conserve corporate resources at a rate exceeding all but a comparative handful of recent years.

Contributing in substantial measure to this increment in corporate cash resources will be the sharply enlarged provisions for amortization made by utilities and others which have received certificates of necessity for accelerated amortization of defense and defense-supporting projects now totalling nearly $20-billion, with the end not yet reached.

Just as the Mills Plan, requiring payment of 70 per cent of the year's corporate taxes in the first six months, spelled heavy pressure on cash resources of many companies, so it will mean at least equally heavy pressure on the Federal government in coming months when only the remaining 30 per cent of corporate taxes is to be paid in the face of sharply rising armament expenditures.

Economy subservient to Federal spending

From an annual level of $45-billion in the first three months of this year, government expenditures for defense and foreign aid jumped to better than a $50-billion annual rate in April. What is more, they are expected to approximate $52-billion yearly for the June quarter and to reach the $60-billion annual mark by the year-end, with this last-mentioned rate continuing through 1953.

The upshot of this will be to make the American economy subservient chiefly to Federal government spending.

Present estimates place at about $35-billion the 1952 expenditures by the government for defense and for foreign aid. This figure would be upped to more than $80-billion if all other Federal expenditures and the outlays by state and municipal governments are added. The resultant total of all government expenditures would represent a sum sufficient to consume approximately one-fourth of the full year's output of goods and service by the American economy. That leaves only 75 per cent of the gross national product to satisfy the requirements of business and consumers.

Not only would the Government's defense spending be felt by the economy, because of its immensity, but equally as much by the manner in which it will have to be financed—by borrowing. Even with the aid of heavy corporate tax payments, the Federal government's budget surplus in the first half-year was a mere $4-billion. The increased armament expenditures, combined with much lower second-half tax payments, under the Mills Plan, should require tremendous borrowing by the Treasury in closing 1952-months. This alone might spell considerable fillip to the stock market.

Utility commons held up well

It might be mentioned in passing that the market for utility common stocks has held up well, considering both the deleterious effect of the decline in industrial company earnings and the large volume of new stock issues which has come to market. There seems to be nothing in the picture which would suggest less favorable market action of the utility shares in the months ahead. According to the tabulation recently released by the Securities and Exchange Commission, new corporate financing of $2.1-billion in the first quarter of 1952 continued the level of the final quarter of 1951. It bettered by 17 per cent the $1.8-billion sold in the first quarter of 1951. Approximately 25 per cent of the 1952 offerings to date constituted common and preferred stocks.

Not only should the market be well-maintained for such further stock offerings as may come along, but the indication is strong that the utility company managements will have a very favorable market on which to bring out the additional bond issues which they will have to market.

The chief factors in this regard are the continuing tremendous supply of funds seeking investment and the shortage of institutional investments, which now are in sight.

With savings banks reporting the highest rate of gain in deposits in six years, and other savings media also showing large gains, the likelihood is that the pressure of funds seeking investment may force bond prices upward next year and cause consequent reduction in interest rates. To what extent these trends may be witnessed is anyone's guess, but the prospects seem promising for utility bond issues which should be coming to market over the months ahead.

To this sharply accelerated trend of deposits with savings institutions pension plans must be added as a source of investment money. The startling growth of pension plans is shown in a survey made recently by the Institute of Life Insurance. This discloses that no less than $6-billion has already been set aside with life insurance companies by employers and employees to back up the guarantees of the retirement plans. Additional premiums under these pension plans currently are being paid to the life insurance companies in an amount exceeding $1-billion per year. The funds, furthermore, are growing at an estimated $400-million a year from plowed-back investment earnings.

Investment of these growing pension funds has already made itself felt in all forms of utility securities which, even to the common stock level, have much to recommend them from the point of view of safety of principal and continuity of investment.

At its inception, this investment company may be limited to $100-million of new securities, which would just about duplicate the investment in common stocks made by insurance companies during the one year which followed the 1951 law liberalizing their investments under New York law.

But even though the next savings banks investment company might push its initial investments to $200-million and gradually increase its assets to as much as $400-million, no basis obtains at present for belief that any sizeable proportion of this new investment will flow quickly, if at all, into common stocks and thus end the current indecision in the corporate stock market.

Future utility financing

Not only one but all the New York bankers who have commented to date on this situation suggest strongly that the investment company will concentrate principally on the preferred stock market, where continuity of income is more assured than in common stocks. These statements were made in discussions at the recent annual conference of the National Association of Mutual Savings Banks.

All the imponderables have not disappeared from the corporate scene. The favorable factors now seem to counterbalance the unfavorable. Utility managements presumably can anticipate being able to bring forth their new money issues on a satisfactory cost basis.

Steam Turbines Practical and Economical in Pipeline Compressor Stations

STEAM turbine-driven centrifugal compressors on natural gas transmission pipelines have been shown to be practical and economical by eight months of operating experience.

"Steam turbines have been used in other industries for many years," F. B. Haverfield, superintendent of compressor stations, Transcontinental Gas Pipe Line Corporation, told the AGA natural gas department at the spring meeting in Los Angeles. "Since their reliability has already been proven, Transcontinental reasonably assumes that future operations of their steam stations will continue to be very satisfactory."

The first steam turbine driven centrifugal compressors to be applied to a gas pipeline was installed by Transcontinental in 1951. Three of the steam stations and sixteen conventional gas engine stations were built on a 30" pipeline system.

"Our operating experience has shown that the steam stations have performed equally as well as the gas engine stations," Mr. Haverfield concluded.

"The steam centrifugal station consists of three 5,000 hp compressor units, making a total station installed horsepower of 15,000. The make of equipment varies from station to station. The general plant layouts and functions are identical. Each station furnishes its own auxiliary power, water and maintenance facilities.

"The multistage impulse turbines, operating at a maximum speed of 5,500 rpm, are directly connected to the centrifugal compressors. This complete unit is mounted on a surface type condenser which serves as the foundation.

"The centrifugal compressors are single stage, designed for a maximum operating pressure of 900 psig. These compressors are equipped with high pressure oil seals to prevent gas leakage.

"The three compressors are piped to operate in series, therefore, the entire gas flow goes through each unit. The flow conditions existing during a recent test are shown [in diagram]. Gas enters the first unit at 467 psig and is discharged from the third unit at 789 psig. Normally the plants operate on an 800 lb. discharge. By-pass arrangements are such that any one of the units may be isolated and the remaining combination continue in operation. The differential pressure or compression ratio depends on the speed of the unit or units. Automatic regulator equipment actuated by the discharge pressure controls the speed of the turbines. Overspeed governors on the turbines are an additional safety device to prevent excessive speed that may result in damage to equipment. This control equipment also prevents over-pressuring the pipe line.

"The steam generating equipment consists of three semi-outdoor integral furnace boilers, each designed to deliver under normal operating conditions, 43,000 lbs. per hour steam at 625 psig and 750° F. Each boiler has forced and induced draft fans and has complete automatic feedwater and combustion control.

"The instrumentation is very complete, making the station operation simple and efficient.

Make-up water is demineralized

"The make-up water to the steam cycle is passed through a demineralizer unit having a two-stage ion exchange bed. This reduces the total dissolved solids in the water to ten parts per million and no more than two-tenths parts per million silica. The cooling tower water is conditioned to control algae and delignification.

"Two turbo-generators furnish auxiliary power. Each generator has a rating of 800 kw, which furnishes three phase, 480 volt, 60 cycle electric power. All motor starters and electrical switching facilities are located in the boiler house.

"Experience shows that about 1 per cent of the boiler steam flow is required for make-up to the steam cycle. The cooling tower requires 5,000 barrels of water per day.

Boiler efficiency is 83 per cent

"Our performance tests of the steam plants have developed the following results. The over-all boiler efficiency is 83 per cent. At the same time, the Rankine cycle thermal efficiency for the main turbo-compressor units is 73.8 per cent. The over-all plant thermal efficiencies are found to be 21.5 per cent.

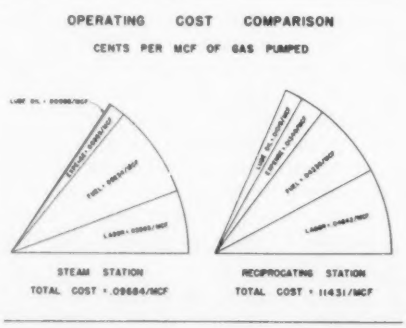
"It has been found that the turbo-compressor combination has a great deal of flexibility, both by varying the speed of the units and by removing units from the line.

"The gas engine stations with which we are comparing the steam stations are of approximately the same horsepower and have from five to seven units.

Steam stations are more economical

"A comparison of Transcontinental's construction costs shows that the investment required for a centrifugal station is

(Continued on page 36)



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- *Geology
- *Drilling and Completion

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- *Reformed gas
- *Hi-Btu oil gas

Liquefied Petroleum Gases
- *Sources, properties and uses

Basic Gas Laws
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- Supercompressibility

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- *Corrosion and pipe protection
- Compressor stations
- Hydrates and dehydration
- *Gas conditioning
- Flow formulae
- Orifice meter measurement

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- *Methods of storing gas

Gas Distribution
- *System design and operation
- *Pressure Regulation, Part 1
- *Pressure Regulation, Part 2
- *Leak detection and control
- *Metering
- Measurement and accounting
- Odorization

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- Combustion characteristics
- Domestic
- Commercial and industrial
- Interchangeability

Conversion Practices

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- *Corporate structure
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*** Indicates chapters that have been printed since January 1, 1951; available without charge to new subscribers to American Gas Journal.**

How to Use the Material

American Gas Fundamentals *is a comprehensive compilation of basic gas facts to guide any gas utility employee toward a broader understanding of the industry as a whole. It is written in layman's language so that the technical fundamentals of every subject treated may be digested and understood by the non-technical reader.*

The series is designed to be removed from each current issue of AMERICAN GAS JOURNAL *and filed in a ring binder where it may be accumulated into a text book of permanent usefulness. Material should be filed under the major subject head appearing in the upper right hand box at the head of each chapter.*

Gas Odorization in Distribution Systems

ODORIZATION OF FUEL GAS is essential whenever the gas is so odor-deficient that leaks from transmission lines, distribution systems, building piping, and appliances cannot be detected by the consumers.

Odorization is practiced almost exclusively by companies distributing a gas high in methane, propane or butane. This generalization does not hold for companies distributing straight Appalachian natural gas, which is high in methane but has a distinctive natural odor—thought to be due to higher hydrocarbons. Applachian area companies are using increasing amounts of Texas and Gulf gas which is reducing this odor level.

The need to odorize is easily and unmistakeably determined by the trend in incidence of customers' leak-complaints. A reduction of odor intensity invariably is reflected in a reduction in the average number of daily leak reports.

Customers in areas formerly distributing straight manufactured gases are accustomed to a powerful gas odor. The average gas company converting from carburetted water gas to natural gas in these areas anticipates about twenty leak-complaints per ten thousand meters per week.

The average gas company in an Appalachian natural gas area expects about eight leaks per ten thousand meters per week, and gives serious consideration to adding odorant to the gas when dilution by odorless Texas and Gulf gas results in a consistent report below this rate.

Continuous odorization of gas in this country began about 1928. In the 1930's some states enacted legislation making odorization mandatory. Few states presently require odorization of all domestic and commercial gas, but a greater number of them require odorization of gas used in schools and other public buildings. Gas utilities meet this requirement by continuous odorization of all fuel gas.

Odorants

Odorants are classified as "dilute" or "concentrated." Use of the dilute type has declined, but not to the point of extinction. Dilute odorant is used at a rate of about 20 pounds per million cubic feet of gas, whereas a concentrated odorant is used at a rate of only one pound per million cubic feet.

Dilute odorants, despite their bulkiness, have the advantage of ease of control because the injection rate need not be controlled very precisely. One pound of dilute odorant more or less per million cubic feet of gas makes very little difference in odor intensity; one pound of a concentrated odorant more or less is the difference between no odor and so much odor that there is a costly surge of fictitious leak complaints that really are only pin hole leaks, or delayed-ignition and after-turn-off whiffs of gas.

Dilute odorants are not volatile enough to odorize high pressure gas. With the advent of higher pressures at the city gate stations, where odorization is usually performed, it became necessary for some gas companies to use concentrated odorants. At the same time, odorization methods and controls have improved so that use of the more convenient concentrated product is now feasible for any volume of gas flow.

Chemicals acceptable to the gas industry as odorants must meet certain physical and chemical specifications. The first of these is odor type, which should suggest or be similar to the odor of manufactured gas. It must not be similar to any household odors.

All commercial odorants are organic sulphur compounds. They are used in such minute quantities that they add only 0.2 grains of sulphur per 100 cubic feet of gas. Up to ten times this quantity of organic sulphur is considered below the preferred maximum, and most public utility commissions permit 10 grains per 100 cubic feet.

Chemicals used as odorants are liquids having boiling points ranging from 90°F to 212°F. They have very low freezing points, *minus* 50°F or lower. They are not particularly corrosive, even in the liquid state, to none-copper metals. Aluminum is notably resistant to attack by odorants. Copper and brass should be kept from contact with liquid odorant although cadmium and tin plated brass parts have given good service.

Where to Odorize

Odorizers are usually placed at city gate stations, on the low side of pressure regulators. This location has the advantage of injecting the odorant into low pressure gas where the linear velocity is higher than on the high side, so that evaporation and diffusion into the gas stream can more readily occur. Also, at this point the pressure is more likely to be constant.

Not many odorization systems have reliable variable pressure compensators, because the need for them is not great; it is usually possible to select a point of constant pressure for odorant injection. Excellent pressure instruments are available, but their use entails what most companies consider an unwarranted expense.

Another and even more important reason for odorizing at the point of constant pressure involves the phenomenon of adsorption. All odorants belong to the class of chemicals that are readily adsorbed. Pipe scale and dust exhibit this effect to a marked degree. During the period that is necessary to saturate the scale and dust layer, much odorant is removed from the gas. It is common practice to over-odorize a new line or system heavily, so-called "slugging," to reduce the length of time for saturation, and to insure a safe odor level in the distribution system during this break-in period.

If the pressure at the odorizer were to decrease sharply, so much de-sorption of odorant would occur that the effect would be that of over-odorizing by several hundred per cent. If the pressure at the odorizer were to increase, adsorptive removal of odorant from the gas stream would resume, and a dangerous odor deficiency would result.

It can be seen that selecting a point of fairly constant pressure for the odorizer is essential. This matter of adsorption and desorption is one of the reasons that gas is not odorized at the source. There would not be much point to adding the odorant in Texas. In a 2,000 mile transmission line, pressures up and down the line vary throughout the seasons, even throughout some days.

Some apprehension is felt by compressor maintenance superintendents that odorant breakdown, from the elevated temperatures within compression chambers, might occur and cause expensive, if not disastrous, shutdowns. Other observers have the opinion, however, that odorized gas does not cause damage to compressers, noting that odorants do not thermally decompose below 600°F, and compression chambers do not run hotter than 300°F.

Who Does the Odorizing

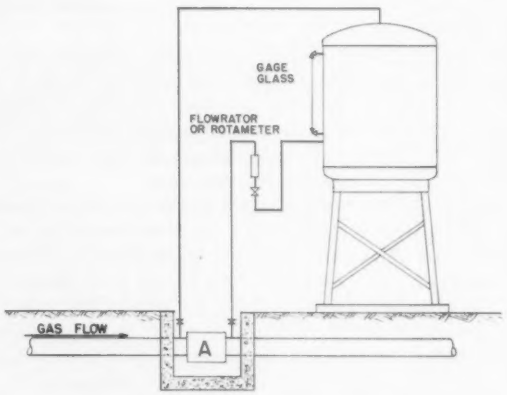
It is safe to say that 95 per cent of the odorizers in use are owned and operated by gas distribution utilities. The other five per cent are used by gas transmission companies and the few industrial plants that do their own odorizing. Transmission companies that odorize put enormous quantities of gas through their equipment, so that with only five per cent of the number of odorizers, they odorize about 30 per cent of the total volume of gas.

The transmission companies add what they consider a safe amount of odorant for their purposes but their customers, the distribution utilities, generally add more to bring the level to their particular standards.

Sometimes the odorizing is done by the distribution company and paid for by the transmission company. Odorized natural gas that is reformed has no odor after reforming, and this fact accounts for much "double" odorization.

Liquid Injection Odorizers

Equipment for introducing odorant into the gas stream falls into two broad classifications: liquid injection odorizers, and evaporation or absorption type odorizers.



LIQUID INJECTION—DRIP ODORIZER

Simple gravity flow (non-proportioning) where A is straight pipe
Forced flow (non-proportioning) where A is regulator
Proportioning flow where A is orifice plate or partially closed valve

In liquid injection equipment, liquid odorant flows into the full gas stream, where it evaporates and diffuses into the gas. Injection systems proportion the odorant flow to the gas flow automatically or manually. It is only at attended stations that manual proportioning is used. Many users of manual equipment adjust the feed hourly, letting the previous hour's gas flow determine the odorant rate.

An overhead tank for the odorant, an injection line with needle valve and liquid meter (such as a rotometer), and an equalizing line, are the only pieces of equipment needed for the simplest injection system, the gravity drip odorizer. This type of odorizer has only the gravity head to maintain the set rate, and of course the head decreases as odorant is used.

A variation of this type of equipment is the odorizer connected around a pressure reducing regulator, where the odorant is injected on the low side and the supply tank is connected to the high pressure.

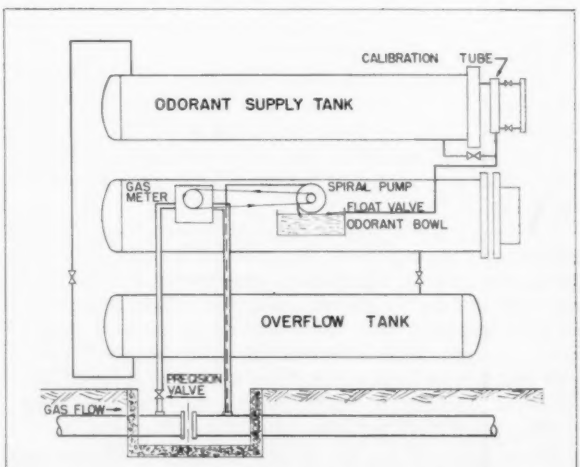
Proportioning Drip Odorizers

The proportioning drip injection odorizer is connected around an orifice plate, or other obstruction in the gas main, across which a differential will exist of a magnitude depending on the gas flow. The same hookup as for connection around a regulator is used. The differential across the orifice plate will also be across the needle valve, so that as the gas flow changes, the odorant flow changes proportionately.

Once set for the desired rate, this odorizer would not need any attention, other than replenishment of odorant, were it not for certain limitations. The gravity head of liquid, which falls as odorant is used, is a non-proportioning effect. Liquid flow through a needle valve does not have the same differential characteristics as gas flow through a sharp edged orifice. Needle valves are rather easily obstructed by minute dust or scale particles. Some odorants become very viscous at low temperatures, and their rate of flow through a needle valve can therefore change markedly from hour to hour.

Meter-Spiral Pump Odorizers

With the meter, or spiral pump, type of odorizer, a differential in the full gas stream is produced by an orifice plate, and an ordinary iron case meter is connected across



LIQUID INJECTION METER TYPE ODORIZER

this differential. The meter shaft is connected by a sprocket chain drive to a hollow shaft having a scoop which dips into a bowl of odorant. The odorant level in the bowl is kept constant by a line from the supply tank and a float valve. The entire mechanism is encased, and operates at line pressure. As the meter revolves, in perfect proportion to the main gas flow, a positive amount of odorant is picked up by the scoop, and deposited into a compartment with a weir, thence to a conveying tube to the gas stream. The weir produces a smooth feed of odorant rather than a slug each time the scoop lifts.

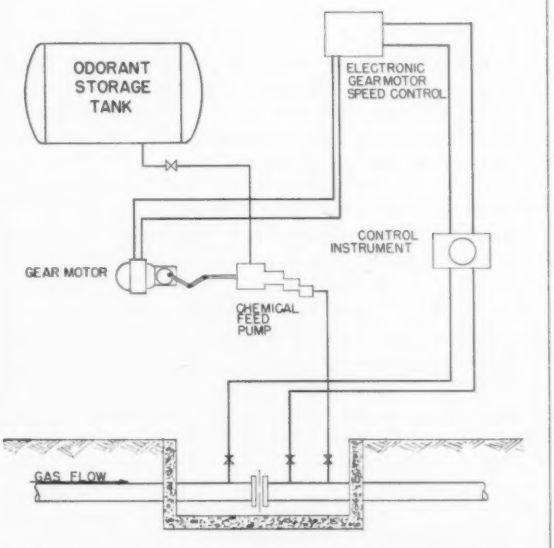
The meter type of odorizer is the most popular commercial design in use. The rate of odorant injection can be varied for a given revolution of the meter by varying the liquid level, and/or by changing the sprocket ratio. There is a wide range of odorant injection rate possible for a single model.

Chemical Feed Pump Odorizers

The most advanced odorizers, in use at an increasing number of high volume odorization stations, are chemical feed pumps. These are very rugged, high pressure, precision built, controlled volume units, whose materials of construction are capable of handling highly corrosive fluids.

Several types of chemical feed pumps are being used in odorant service, among them the piston type, the piston-diaphragm, and the rotary positive or gear pump. They can pump against enormous pressures with zero-gauge suction.

Proportioning of odorant injection to gas flow is usually accomplished by varying the speed of an electric gear motor drive. The electronic speed control device is actuated by an orifice-produced differential in the gas stream. One drawback to this system is that the electronic device cannot be made explosion-proof. Certain installations are using gas pressure to drive the pump, turbine-fashion. The power gas is vented to atmosphere after leaving the turbine. Proportioning is accomplished by a piston positioner controlled by an orifice-produced differential.



INJECTION TYPE CHEMICAL FEED PUMP ODORIZER

Absorption or Evaporation By-Pass Odorizers

With the evaporation by-pass odorizer, a small proportion of main stream gas is by-passed around an orifice plate or partially closed valve. The by-pass gas, known as "sweep gas," is saturated with odorant when it leaves the tank.

For example, 1,000 cubic feet of sweep gas saturated at 30 psi gauge and 50°F may contain 1.0 pound of amyl mercaptan. This is sufficient to odorize 1,000,000 cubic feet of gas.

Under these conditions, the sweep gas lines and valves should be designed to pass 1,000 cubic feet of gas while 999,000 cubic feet are going through the main line orifice.

The evaporation by-pass odorizer is very popular with many gas engineers. It can odorize a single service at low distribution pressure, or it can odorize a 30,000,000 cubic feet daily sendout at 600 psi. It requires an odorant with uniform evaporation characteristics—a pure, single-component chemical rather than the wide boiling blends useable in injection odorizers.

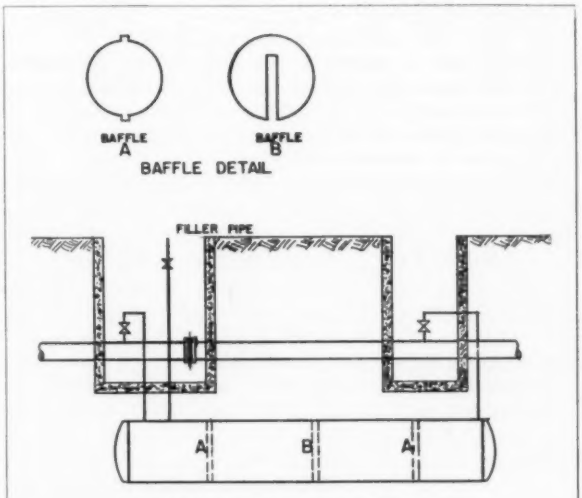
The odorizing rate of an evaporation by-pass odorizer is affected drastically by fluctuations in odorant temperature. Temperature variations can be minimized by using a buried tank. In addition, it is customary to adjust the sweep gas flow-control valves seasonally. Other systems make use of thermostatically controlled heating elements, which eliminate the need for underground tanks.

The evaporator is usually a horizontal tank. Sweep gas enters close to the high pressure end and leaves close to the low pressure end. Odorant pickup is assisted by baffles in the tank that create turbulence. An alternative to baffles is use of wicks. Wicks not only produce maximum evaporation but also, by capillary action, make odorant pickup independent of the amount of odorant in the tank.

A drawback to this type of odorizer is the difficulty of measuring instantaneous rate of odorization. Its simple, foolproof design makes it a favorite of many, none the less.

Odorizer Buildings

Even though care be taken that no leaks exist in odorizer installations, few if any odorizers are so perfect that no



ABSORPTION TYPE ODORIZER

odor escapes to the adjacent area. Merely filling the odorizer, as needed, releases enough odor to cause some anguish to nearby residents.

Odorizer buildings fall into two classes:

POSITIVE PRESSURE TYPE—Those with blowers that maintain a positive pressure on the building and force the contaminated air out through an activated charcoal filter. The building is made as airtight as possible. Before anyone enters the building, the blower is operated long enough to decontaminate the air inside. Then, workers enter, with the blower still running, to adjust and maintain equipment, and transfer odorant from shipping drums to storage tanks. After workers leave the building, the blower is turned off and is not operated again until someone is about to enter the building.

NEGATIVE PRESSURE TYPE—Here, buildings are equipped with blowers that maintain a negative internal pressure at all times. With the blower operating continuously, the building need not and must not be airtight. Air is drawn from the outside, replacing the contaminated inside air which is sent through the blower and then through an activated charcoal filter before being released to the atmosphere.

Odorant suppliers recommend the proper neutralizer for their particular product. The mercaptan odorants can be neutralized with household bleach or potassium permangate. Dilute acetic acid is recommended for some of the less reactive odorants.

Measuring Odor Intensity

Odor intensity can be lost or reduced by adsorption or oxidation of the odorant by pipeline deposits and scale.

A means for measuring the amount of odorant present at any and every point in the distribution network is very important. While it is true that the leak-complaint reports mentioned previously supply the most significant information about odor intensity, it is necessary to plot the leaks on a system map to know whether the intensity is uniformly distributed.

Even when the locations of the leaks are mapped and appear to be well distributed, odor deficiency at dead ends might be easily overlooked if there are a number of leaks nearby. If odorant is present at dead ends as shown by smell test or gas analysis, it is safe to assume that it is present at intermediate points.

The room test is the most reliable of the smell tests. Gas is metered into a room occupied by average observers. When everyone can smell the gas without question, the gas-air ratio is noted. A ratio of one half of one per cent is considered quite safe, and as high as one per cent is acceptable.

An interesting new instrument admits gas through a mixing valve, which mixes the sample with variable quantities of air. The mixture is sniffed at an opening in the top. Starting with the leanest gas-air ratio, the operator increases the ratio until he can easily detect odor. Then he presses a button which closes the circuit of a built-in hot wire explosimeter. The meter needle indicates what per cent gas in air is necessary for detection.

Chemical analysis of the gas is a practical method for tracing odor travel. Chemical reactions which occur only when and to the extent that odorant is present are utilized for detection.

One portable instrument for odorant intensity measurement is a colorimeter, similar to a tar camera. Gas is passed through a one inch diameter, special filter paper treated with copper oleate. Upon exposure to the rays of a sunlamp, the color of the paper changes from green to brown, with intermediate shades depending on the amount of odorant present. A chart for comparing the color produced with standard colors corresponding to a full range of odor levels completes this equipment.

There are legal aspects to having a record of odorization. Often, in the course of public investigations following explosions, the existence of semi-permanent records, has forestalled charges of negligence against the gas utilities concerned.

Some utilities have adapted chemical laboratory methods of analysis to field use, and the records of these tests are equally suitable evidence that there has been due regard for public safety, with respect to odorization.

Loss of Odorant

It has been observed by many utilities that have changed to oil bath gas scrubbers that odorized gas loses no odorant to the oil. It is desirable, and may be important, to odorize downstream of the oil bath because of the adsorptive effect of dust particles in extremely dusty conditions. This is not necessary with average dust conditions.

Oil fogging has a beneficial effect on odorization when dust conditions are worse than average or when pipe scale removal of odorant persists.

It is an unfortunate characteristic of odorant chemicals that many soils are capable of removing them quite completely from gas escaping that escapes through underground leaks.

Some engineers question whether this holds true for the odor in manufactured gas, as well. A manufactured gas leak filtering through soil and into a building can give warning of its presence, even without odor, through the nausea of carbon monoxide before an explosive concentration is reached.

A similar warning exists for natural gas. A concentration of natural gas in a room, for example two per cent gas in air, can signal its presence by formation of aldehydes at burners. These aldehydes are potent eye irritants. They are formed by improper combustion, the result of gas being in the primary and secondary air. Any customer complaint involving eye irritation should be investigated with a combustible gas indicator.

Regional Differences in Odorizing Rate

There are marked differences in odorizing rates throughout the country. In general, companies in the South use a lower rate than those in the North. It is known that the olfactory sense is more acute at higher temperatures. This fact explains why a southern gas company may use only 0.5 pound of odorant per million cubic feet of gas, and a northern gas company may use a full pound of the same odorant. LP gas is odorized by the producer, at a rate of about one pint of odorant to each 10,000-gallon tank car of propane or butane.

This chapter on Gas Odorization was prepared by Walter J. Fitzgerald,
Gas Odorization Engineer, Sharples Chemicals Inc.

GAMA Ponders "Operation Sales"

(Continued from page 19)

ernment relations, stimulate better merchandising, institute a dealer training program, and sell gas and gas appliances to the industry's various customer-groups.

In the first general evening meeting, Frank C. Smith, president, Houston Natural Gas Company, stressed the need for more coordination in merchandising, selling, sales training and servicing policies by appliance manufacturers and the gas utilities. Gas companies, he said, should give manufacturers the benefit of their suggestions and of their field experiences in customers' homes. He advocated service training centers where utilities' employees could be instructed in the mechanics and the servicing technics of every type and make of gas appliance.

Commenting on the question of dealer versus utility merchandising, he stated the problem is not one of creating a uniform program for all areas, but rather of convincing the customer that any program in effect, and the gas service that it advances, are in his best interest. He urged unity in purpose and coordination in attainment of objectives by the gas and gas appliance industries, saying "if ever there was a time for united action it is now."

In his president's address, Louis Ruthenberg, chairman, Servel, Inc., described the gas appliance industry as "traditionally a reliable barometer of business ups and downs." Five factors which, he said, will contribute to its even greater expansion in 1952 include: new extension of natural gas service; a large remaining potential for LP gas, despite a four-fold increase in the use of this fuel since 1941; continuation of a ten-year trend which shows a 54.9 per cent increase from 19,146,000 to 29,662,000 in the number of residential gas customers; a coordinated program of advertising and promotion by AGA, GAMA, dealers and utility companies, involving an outlay of $10,000,000 this year; and a big replacement market for fully automatic gas ranges, water heaters and refrigerators.

Above all, Mr. Ruthenberg said, salesmanship—"a bloodless casualty of World War II"—must be revived. "During eight long years of approaching hostilities, actual war and a postwar sellers' market, selling muscles have atrophied," he said. "Notwithstanding the highest real-wage level in history, savings without precedent, record construction and residential building, the nation's potential sales volume has never materialized."

Charles E. Bennett, president of The Manufacturers Light and Heat Co., and of AGA, praised GAMA's planned effort to win public favor for gas and gas appliances. He urged gas industry executives to continue raising their sights and to "be more concerned with where we are going than where we have been."

"When in one year the American public consumes over six trillion cubic feet of natural gas, plus a large amount of manufactured gas," he said, "we have every right and a responsibility to act and progress as important leaders in American life."

In a marketing symposium Donald R. Meckstroth of Servel, Inc., chairman of GAMA's general marketing committee, outlined the need for statistics to establish market patterns and provide yardsticks by which manufacturers can measure their own selling performance.

In a color slide presentation titled "Marketing Spots Before Your Eyes," vice chairman-elect of the marketing committee, A. F. Smith, manager, department of business information, A. O. Smith Corp., dramatized the thesis that "markets are people" by tracing the living, visiting and buying habits of families in small communities.

A dealer relations general session featured the final day of the GAMA meeting. Emphasizing "Retailing's Role in a Free Economy," Rowland Jones, Jr., president, American Retail Federation, called retailing "the most important economic activity in the country." He likened the retailer to the anchor man on the merchandising relay team. "He is the most important man on the team," Mr. Jones said, "because, until he reaches the finish line and delivers the goods, the race for the market is not won."

Julius Klein, president, Caloric Stove Co. and chairman of the CP manufacturers group, discussed a new nationwide sales training program designed to upgrade gas range sales. J. P. Hutchinson, sales manager, Lawson Manufacturing Co. and chairman of GAMA's gas water heater division, demonstrated the use of a sound-slide sales training film titled "The Golden Stream" which rounds up a variety of proven sales techniques employed by jobbers, wholesalers, utilities and large retailers in selling water heating equipment.

Pipelines Must Share Industry Promotion Natural Gas Meeting Told

(Continued from page 18)

tinued customer acceptance of gas; a study of customer service responsibilities with respect to gas companies, manufacturers and dealers, an analysis of service costs, and a correlation of service policies with the industry's safety experience."

In an enlargement of his consideration of safety, Mr. Bennett recognized that "series of happenings during the past year or two has created an impression in the minds of the public that our operations and our product are hazardous." The gas industry has not done a good job in its public relations on safety aspects, in his opinion.

"It is a problem that cannot and must not be ignored."

Sixty-six years ago, Mr. Bennett said, the remarks of a Mr. W. H. Denniston were published in the December, 1886 issue of AMERICAN GAS JOURNAL to warn the manufactured gas industry that it would have to reckon with natural gas in the future. Then, speaking about the changes that have been brought about since the widespread introduction of natural gas, Mr. Bennett pointed out that within AGA there is little reason for distinction between the manufactured and natural gas departments.

"Many of their former individual problems now have become common problems. Their future efforts and activities point in the same direction," he said.

Expenditure for fundamental research is a necessity for continued growth of the gas industry, contended C. H. Zachry, president, Southern Union Gas Company.

In a review of AGA research, he pointed out that the Promotion, Advertising and Research plan is now in its eighth year.

"This year," Mr. Zachry said, "the budget for natural gas production and transmission research is $88,500 and, as of April 1st, 61 per cent or $53,400 had been subscribed."

"While I do not believe that we are faced with a shortage of natural gas in the reasonable future," Mr. Zachry said, "a number of far-seeing people have shown interest in the eventual production of pipeline gas from coal, and it is certainly a good thing to have some insurance, such as the several projects that are under way."

Rapid expansion of the natural gas industry will require 2,500 new supervisory and management employees during the next ten years, said F. O. Rouse, consultant, Commonwealth Services, Inc., New York. Shortages of technically-trained and experienced general management men, he said, are compelling business to train and retrain the employed specialist to develop the generalist—the top management man.

Fewer than half the number of engineers needed in industry and government will be graduated by engineering schools during the next five years, Mr. Rouse continued.

Astronomical reserves of natural gas will keep flowing for decades, said Claude A. Williams, president, Transcontinental Gas Pipe Line Corporation.

As a result of "the vigorous competition for gas reserves which has advanced the recent field price of gas so precipitously," Mr. Williams expressed belief that gas sales prices will continue to rise in relation to competitive fuels.

"This is as it should be," he added, "as there is no good reason why the finest fuel in the world should be the cheapest fuel."

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Safety Is Emphatic in Georgia Peak Plant

(Continued from page 19)

plant, being a peak shaving facility, runs infrequently and color coding of pipe is considered a safety measure in operation.

Cooperation with fire department

The entire tank and unloading area is covered by a sprinkler system. Each tank has 23 spray nozzles that deliver approximately 50 gallons per minute. The quick-opening valve for the sprinkler system is located outside the fence area in a pit near the street. All company personnel are familiar with its location and operation. The spraying system will be of great value in keeping tank pressures below blow-off valve pressure in the case of a nearby fire.

Located at remote corners of the plant area are two-wheeled dry powder extinguishers. There are, also, 30-pound dry powder extinguishers located in the buildings which house the propane-air production equipment. The local fire chief has instructed at least one man on each shift of all fire stations in the city as to the tank sprinkler valve locations and the operation and location of the dry powder extinguishers.

The meetings with the fire department to discuss the location of this equipment, its operation, and the properties of propane has resulted in a very close relationship with the fire protection group, and has been of value in overall city government-gas utility relationship.

Safety in the operation of the propane-air production equipment is considered as important as safe storage of the propane. The buildings are all of steel-and-concrete construction. The air compressors and boiler are in a separate building located about forty feet from the building that houses the mixing-vaporizing-proportioning equipment and the control room. A vaporproof partition separates the mixing-vaporizing-proportioning equipment from the control room in that building.

Fused shut-off

Shand and Jurs valves are incorporated in the liquid line that leads from the storage area to the vaporizer and in the made-gas (propane-air) line that leads to the distribution system. These valves are held open by hydraulic pressure, maintained around 300 pounds per square inch. The high pressure hydraulic oil line leads to the two valves and around the wall of the mixing-vaporizer-proportioning room, with a fusible plug every five feet. In event of a fire in this room, the fusible plugs will melt result-

ing in a loss of the hydraulic pressure which will shut off the flow of liquid propane to the vaporizer and the flow of propane-air to the distribution system. These valves may be closed manually.

All tools used in the operation and maintenance of the plant are of the spark proof type and all lights, both standby and regular, are vaporproof.

Sparkproof telephones

A sound-powered telephone intercommunication system connects all parts of the propane-air plant with the company dispatcher. This system requires no external current for operation and facilitates rapid communication within the plant and between the plant and the company's dispatcher whose office is located remote from the plant. Telephones located in hazardous areas are also vaporproof.

The problem of smoking has been solved by simply not allowing smoking anywhere within the plant and storage area. Although there is an open flame at the boiler and another open flame in the control room, it is believed that if smoking were allowed in these areas then a person could too easily move from an area where smoking could be permitted into an area where it could not be permitted.

Instrument logging checks safety

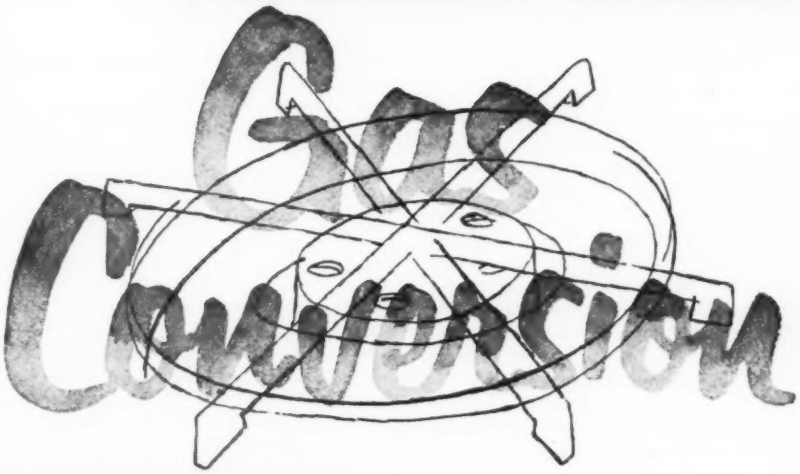
During the operation of the plant the operator makes 15-minute recordings of all instruments. Although a number of these instruments are recording, the logging of 15-minute readings serves the excellent purpose of having the operator travel the area of the two buildings where trouble that may be developing and may be remedied before it reaches dangerous proportions.

Gravity-Btu values maintained

The properties served by this Company have had natural gas (.6 specific gravity) since 1931. There are few of the 100 per cent safety pilots commonly used with propane burning appliances on the system. Because of this, the production of the plant is regulated so that the amount of propane-air mixed with natural gas has a specific gravity of .9 or less. A gravitometer in the control room receives its indication from a point on the distribution system. The operator can quite readily ascertain from the instrument if the gas sent to the customer is .9 specific gravity or less.

Other instruments in the control room indicate the calorific value of the propane-air, which is closely maintained to give a mixture of natural gas that will not adversely affect its burning properties on appliances designed to operate on straight natural gas.

The operations you need to effect



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News of the Gas Industry

COOPERATIVE PAR PLAN IN EIGHTH YEAR

The PAR Plan, the gas industry's cooperative program of promotion, advertising and research, sponsored by the American Gas Association, is reported as completing successfully its seventh full year of operation, by Norman B. Bertolette, president, The Hartford Gas Company, and chairman of AGA's PAR committee.

A PAR program to cost $2,058,500, or 25 per cent above the 1951 level, has been adopted by the PAR committee and approved by the executive board of AGA. The sum of $1,276,000 was allocated on a provisional basis to promotion and advertising. Research authorizations total $705,900.

Mr. Bertolette told AGA members that subscriptions for 1951, totaling $1,623,317, were the greatest since the inception of the plan in 1944. Utility companies supporting the plan represented 72 per cent of the gas industry.

Net expenditures for the year totaled $1,603,559. Of this amount eleven per cent was spent for sales promotion aiding gas utilities directly and in national sales campaigns, exhibits, and other promotional efforts. National advertising expenditures accounted for 51 per cent. Research expenditures utilized 36 per cent of the net. About two per cent was used for miscellaneous administrative expenses.

A significant accomplishment of the PAR Plan during its seventh year was the increasing extent to which gas utilities and appliance manufacturers coordinated their own efforts and participated in the industry's PAR activities, Mr. Bertolette said.

One-third more utilities participated in the 1951 PAR Old Stove Round Up than during 1950, and 90 per cent of these purchased and used PAR promotional materials. Dealer participation also reached a new high. To encourage utilities in stimulating local dealer sales of gas appliances, a well-rounded program for the development of gas appliance merchandising by dealers has been added to the 1952 program.

National magazine advertising of gas range manufacturers reached a new high in 1951, representing 84 per cent of the magazine programs of competing electric range manufacturers. Gas water heater manufacturers again exceeded electric in their use of national magazine space.

United Natural in Expansion Program

United Natural Gas Company will invest almost $4,400,000 this year to expand and improve its facilities, now serving more than 75,000 customers in northwestern Pennsylvania.

LP Gas Associations Consolidate

Liquefied Petroleum Gas Association has accepted the proposal of National Butane-Propane Association for its consolidation with LPGA, Charles Grau, NBPA president, announced. The consolidation is effective immediately and all NBPA members may become members of LPGA.

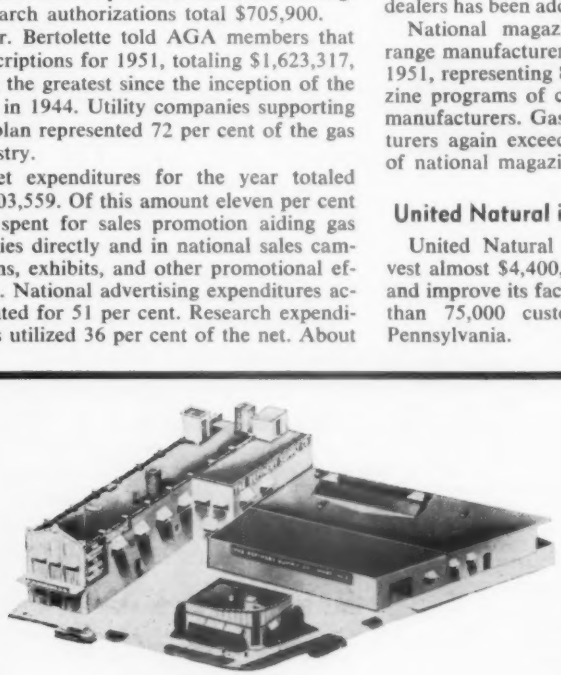
Mr. Grau, president, Oneida Gas Co., Rhinelander, Wisc., said the action was taken in the interest of implementing a stronger and larger trade association.

Mabee New President of LPGA

Foster N. Mabee, president, Colorado Natural Gas & Fuel Co., Denver, was elected president of Liquefied Petroleum Gas Association at the final session of its recent annual three-day convention in Chicago. He succeeds W. S. Lander of Suburban Rulane Gas Co., Charlotte, N. C. Other officers include first vice president, C. M. Ambrose, Jr., president, Liquefied Gas Corp., Seattle, Wash.; second vice president, Frank T. Carpenter, president, United Petroleum Gas Co., Minneapolis, Minn.; treasurer, Walter H. Miller, president, Dri-Gas Corp., Chicago; secretary and assistant treasurer, Arthur C. Kreutzer, Chicago; executive vice president, Howard D. White, Chicago.

Pittsburgh GasCos Win Ad Awards

The Peoples Natural Gas Company won two national advertising awards and shared with Pittsburgh gas companies in the winning of a joint award in the 1952 Better



Manufacturers and Jobbers
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Scientific Instruments
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Ac-Me and R. S. Specialties

Ac-Me Recording Gravitometer
Ac-Me Specific Gravity Gas Balance
Ac-Me Pressure Vacuum Pump
R. S. Portable Vacuum Pump
R. S. Mercury Cleaner
R. S. Manometer
R. S. Dead Weight Gauge
R. S. Dead Weight Tester
R. S. Orifice Well Tester
R. S. Moisture Tester

R. S. Flat Bore Yel-O-Bak Thermometers
R. S. Streamlined Hydrometers
R. S. Pulsameter
R. S. Pressure Hydrometer Jars
R. S. Vapor Pressure Bomb
R. S. Diamond Core Drill
R. S. Thermo Plumb Bob Thermometers
R. S. Thermostat Temperature Controls
R. S. High Pressure Consistometer
R. S. Smoke Meters

Complete Line of Scientific Laboratory Equipment
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CENTRAL SCIENTIFIC COMPANY
CHICAGO

Also Complete line of CENTRAL SCIENTIFIC SPECIALITIES

R.S.G. TULSA
REFINERY SUPPLY COMPANY
CENCO
Laboratory Apparatus and Supplies
Oil and Gas Testing Equipment
621-23 E. 4th St. Tulsa 3, Oklahoma

Copy Contest sponsored by Public Utilities Advertising Association.

Charles L. Yost, general sales manager of Peoples, said that a first place award went jointly to Equitable Gas Company, Manufacturers Light and Heat Company, Phillips Oil and Gas Company and Peoples in the "best newspaper advertisment selling gas merchandise" category.

Peoples won second place in the outdoor category and third place in the "complete programs" classification.

Consumers PowCo Gets Heating OK

Consumers Power Company has been granted permission by Petroleum Administration for Defense to supply natural gas to 15,000 additional space heating customers in its Michigan gas service area. The application had been previously approved by the Michigan Public Service Commission.

AGA Surveys Graduate Shortage

Results of a survey on the effect of the decreasing supply of college graduates to serve the gas industry will be made available shortly by American Gas Association. The survey of companies which employ about 44 per cent of the total industry workers is expected to reflect a fair indication of industry conditions.

Dryer Requirements under Revision

Recommended revisions of standards for gas clothes dryers have been prepared for industry criticism by the American Gas Association subcommittee on approval requirements for gas clothes dryers. Comments received from the industry will be considered by the supervising subcommittee at its fall meeting. Adoptions of revisions will enable manufacturers to incorporate them in their approved 1954 models.

Pacific Products in New Headquarters

Pacific International Products, Inc., manufacturers of valves and fittings for compressed gases, announces the establishment of new headquarters at 475 Huntington Drive, San Marino, Cal.

Royston Has Tulsa Warehouse

Royston Laboratories, Inc., Blawnox, Pa., has acquired additional facilities in Tulsa, Okla., for warehousing its industrial coating products.

Columbia Earnings Dip 22 Cents

Because of an "unwarranted lag" between increases in the cost of doing business and approval of rate increases by regulatory authorities, earnings of The Columbia Gas System, Inc., decreased to $1.03 per share of common stock for the twelve months ended March 31, 1952, compared to $1.25 for the corresponding period last year, Stuart M. Crocker, chairman of the board, reported in the company's quarterly letter to stockholders.

"There is no lessening in the demand for natural gas," he said, "since throughout most of the area served by the System the cost of heating with natural gas is substantially less than the cost of heating with other fuels. . . . With such a situation existing, earnings should not present a problem.

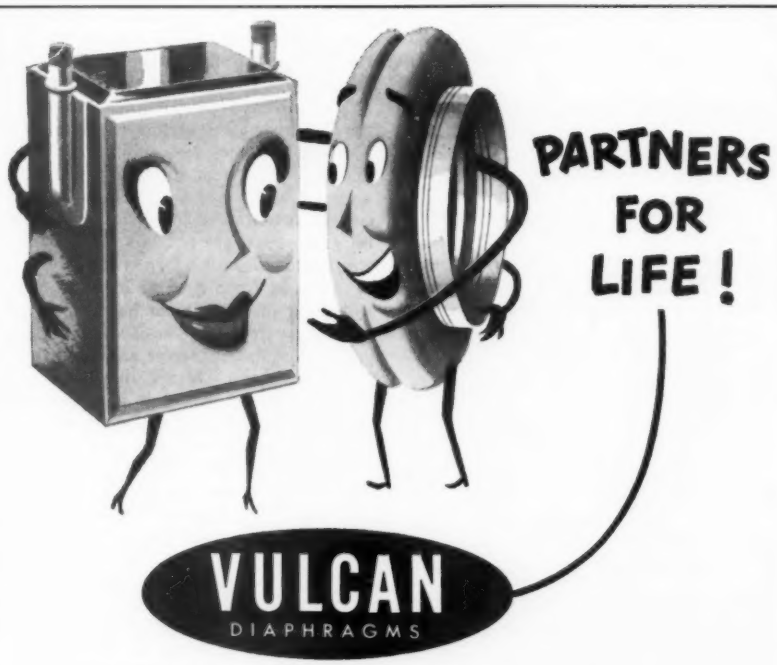
"However, in the regulated utility industry, the obtaining of approval from regulatory authorities for increased service rates is a long and complicated process. Although increased rates are necessary because of the substantial increase in the cost of gas purchased and in labor, taxes and other costs, an unwarranted lag occurs between the time when such costs increase and the time when rate increases are approved," Mr. Crocker said.

Applications involving substantial rate increases are now pending before regulatory commissions and other applications will be filed in the near future, the letter said.

A quarterly dividend of $3,260,000, or 20 cents per share, is being distributed May 15 to 81,000 Columbia common stockholders of record on April 19 in payment of the corporation's 71st dividend on its common stock.

NYPSC Fights Pipeline Rates

The New York Public Service Commission has protested to Federal Power Commission against a 37 per cent increase in the wholesale rate of natural gas proposed by Texas Eastern Transmission Corporation. The New York commission said the raise would cost consumers in the State of New York approximately $4,500,000 a year and that NYPSC will insist on being a party before FPC on Texas Eastern's application. Another fight before the Federal agency, in which the New York commission is engaged, involves the application of Transcontinental Gas Pipeline Corporation for higher wholesale rates for gas it supplies to companies in the City of New York. Transcontinental wants an increase which the commission contends would add approximately $14,000,000 a year.



VULCAN Diaphragms in meters, regulators and controls should serve faithfully for a long and accurate service life.

Why waste time and money on diaphragm replacements?

Why waste time and money on periodic oiling of diaphragms?

VULCAN Diaphragms are scientifically made for utmost strength, perfect pliability. They remain tough yet supple and sensitive year after year in the most exacting service. They contain no oil, yet never need oiling. They work in bone dry gas or at 100% saturation, in all types of gases. They repel gums and condensates . . . never dry out and stiffen.

Join the powerful, nationwide swing to VULCAN Diaphragms, for meters, regulators and controls . . . for high or low pressure operation.

VULCAN RUBBER PRODUCTS, INC

58th Street and First Avenue • Brooklyn 20, N. Y.

Pennsylvania Group Elects Officers

The annual meeting of Pennsylvania Gas Association in Wernersville, May 13-15, was attended by approximately 500 representatives of the manufactured and natural gas industry throughout the state.

Problems discussed during the meeting pertain to accounting, customer-employee relations, distribution and sales promotion.

W. E. L. Irwin, district manager, Philadelphia Electric Company, completed his year as association president and was succeeded by Gordon M. Jones, sales manager, United Gas Improvement Company.

Other officers include first vice president, Andrew S. Morgan, Lancaster County Gas Company; second vice president, J. Henry Long, Philadelphia Electric Company; third vice president, John A. Frick, Allentown-Bethlehem Gas Company; secretary, R. W. Uhler, Lebanon Valley Gas Company; treasurer, James A. Schultz, Reading Gas Company.

Investment Return Adequacy Doubted

Six per cent return probably won't be enough to finance the natural gas transmission industry in its future expansion, August Belmont, vice president, Dillon, Read & Co., told the Southern Gas Association convention in late-April.

Mr. Belmont gave the delegates an analysis of the securities market in view of the projected five-billion-dollar expansion of natural gas transmission facilities in the next five years. Generally speaking, he said, the market required for this expansion is available.

"We are all proudly aware of the record of the industry in continuing to develop reserves at a rate faster than withdrawals," Mr. Belmont said. "However, the industry's ability to put together large blocks of reserves in order to prove the availability of gas for twenty years ahead to cover the new requirements generated by expansion projects, has been becoming more difficult. The ability of the industry to finance the required expansion will of course be dependent on its ability to break loose large existing reserves of gas not now available, or to continue to discover large new supplies.

"It looks from here as if this great projected expansion of your industry will have to be financed on a basis of less leverage and higher fixed interest and dividend cost as time goes on," Mr. Belmont said. "This will tend to prevent new companies from taking as much a part in the expansion program as they have in the past eight years. Existing companies with established operations and with equities selling at the higher price earnings ratios should be better able profitably to finance the industry's expansion needs.

"Hence it seems abundantly clear that the regulatory authorities will sooner or later be forced to recognize the inadequacy of six per cent as a rate of return sufficient to allow the industry to finance its needs."

Tetco Asks to Sell Excess Gas

Texas Eastern Transmission Corporation, supported by present and prospective customers, asked the Federal Power Commission to permit it to allocate its excess natural gas among applicants for improved service.

A prior commission order directed Texas Eastern to pump excess gas, about 91 MMcf daily, into its Oakford (Pa.) storage field.

Seventeen applicant companies want a total of 27 MMcf daily from Texas Eastern's excess. In addition Texas Eastern would supply 45.5 MMcf a day to Public Service Electric and Gas Company, Newark, N. J.

1.5 Million Heating Customers Added

The gas utility industry added 1,514,000 new gas househeating customers during the 1951-1952 heating season, American Gas Association reports. This compares with 1,014,000 gas househeating installations made in the preceding heating season.

Shave those peaks!
Reduce those high demand charges!

—and other increasing costs with a DRAKETOWN PROPANE PLANT. By operating a few days a week or a few weeks a year, it more than pays for itself. As a standby plant, it automatically goes into operation at the turn of a valve.

Whether for augmentation, peak shaving, standby, or 100% service, a DRAKETOWN PLANT, designed, engineered and built to meet your specific requirements is your answer.

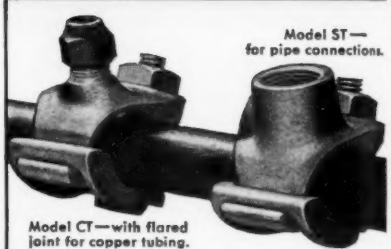
DRAKETOWN

Your assurance of a good job.

Serving utility and industry for over thirty years

DRAKE & TOWNSEND
INCORPORATED
Consulting • Design • Engineering • Construction
11 WEST 42ND STREET • NEW YORK 18, N. Y.

Quick easy way
TO MAKE GAS AND WATER CONNECTIONS
FOR REFRIGERATORS, LAUNDRIES, WATER-HEATERS, ETC.



SKINNER-SEAL SADDLE TEE—for making gas and water connections. No pipe cutting or threading. Quick. Easy. Cuts costs. For gas refrigerators, home laundries, heaters, etc. Write for circular.
Approved by Underwriters' Laboratories, Inc.

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Serving the Gas Industry
Designers • Fabricators • Erectors
Gas Plant Equipment and Industrial Furnaces
A HALF CENTURY OF SERVICE
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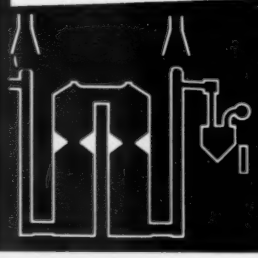


- BLUE GAS PLANTS
- WATER GAS MACHINES
- WASHER COOLERS
- CHARGING MACHINES
- GAS PURIFIERS
- CONDENSERS
- WASTE HEAT BOILERS
- PRODUCER GAS PLANTS
- HIGH BTU OIL GAS PLANTS

MEN AT WORK

GarWood Advances Sales Execs

In a series of appointments announced by GarWood Industries, Inc., H. H. Hippler has been named assistant director, sales and advertising. R. F. Whitworth, formerly sales manager, national accounts, has been named to succeed Mr. Hippler as manager of GarWood's branch division.

Two Rockwell Men Advance

The elections of L. A. Dixon and Jas. E. Ashman as executive vice presidents have been announced by Rockwell Manufacturing Company.

American Natural Elects Two Officers

Elections of Mr. Ralph T. McElvenny as executive vice-president, American Natural Gas Company, and of Mr. John Dern as general counsel was announced last month.

Doty Takes Oath as Member of FPC

Dale E. Doty, recently confirmed by the Senate, took the oath of office as a member of Federal Power Commission on May 22.

HILDING V. BECK has been appointed application engineer, *American Meter Company*.

JOSEPH N. BETZ has been appointed manager, commercial division, *The Manufacturers Light and Heat Company* and other Pittsburgh group companies of The Columbia Gas System.

PAUL E. DUFENDACH has been named assistant to the chief engineer, *Texas Gas Transmission Corporation*.

JOHN H. HAYES has been appointed personnel director, *Equitable Gas Company* and affiliated companies.

HERMAN G. HORSTMAN is now assistant to the president, *Texas Gas Transmission Corporation*.

H. W. KING has been promoted to regional manager, West Coast sales, *Worthington Corporation*.

J. P. MCARTHUR is manager, Philadelphia district sales office, *Worthington Corporation*.

P. L. MCMANUS has been promoted to manager, San Francisco district office, *Worthington Corporation*.

FRANKLIN K. RADER has been named supply contract representative, *Texas Gas Transmission Corporation*.

THOMAS L. RYAN has been named director of information, *The Manufacturers Light and Heat Company* and other Pittsburgh group companies of The Columbia Gas System.

ALBERT W. SMITH has joined *Ebasco Services Incorporated* as advertising and sales promotion consultant.

JOHN D. VAN NORDEN has joined the sales staff of *American Meter Company* in the Atlanta territory.

CLYDE WATSON is now supervisor of public relations, *Texas Gas Transmission Corporation*.

EDWARD L. WYNNE has been appointed sales representative, Chicago territory, *American Meter Company*.

Truett Advanced by American Meter

Bertram S. Truett was appointed recently to the position of district sales manager, San Francisco, by American Meter Company. Mr. Truett has been with the company since 1937 and, with the exception of his war service, has been in sales positions since that time. In his new position, he will cover northern California, northern Nevada, Washington, Oregon, Idaho and Hawaii.

B. S. Truett

A. J. Kerr Resigns Rockwell

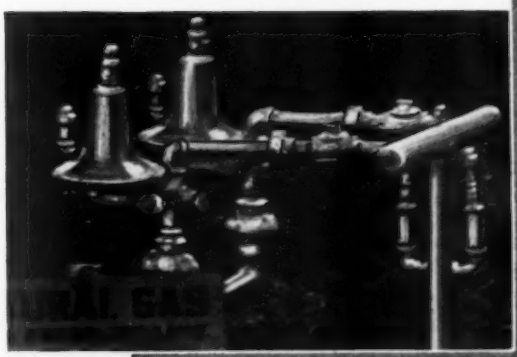
A. J. Kerr, vice president, meter and valve sales, Rockwell Manufacturing Company, has resigned effective June 1. Mr. Kerr is forming his own company to develop and sell products to the oil and gas industry.

He was cited for "outstanding service to the gas industry" by Gas Appliance Manufacturers Association at the annual meeting in Colorado Springs for his efforts as chairman of the gas meter and regulator division.

Blaw-Knox Elects New Chairman

W. C. Snyder, Jr., president and chief executive officer of the Blaw-Knox Company, has been elected to the additional post of chairman of the board of directors.

A WIDER RANGE ... of Delivery Pressure Control



REYNOLDS HIGH PRESSURE LINE REGULATORS

in parallel hookup have an increased range of capacity as well as a wider range of delivery pressure control. This also provides greater margin for emergencies. On inlet pressure the range is up to 650 pounds. For outlet pressure, this unit assures absolutely accurate and dependable control from 2 to 100 pounds. This variance in outlet pressure is made by use of different sizes of diaphram cases and further flexibility in the spring type is possible by use of different strength springs.

BRANCH OFFICES

H. D. "MIKE" MEUFFELS
423 Dwight Building
Kansas City, Missouri

SEIDENGLANZ & CO.
2nd Unit, Santa Fe Building
Dallas, Texas

REPRESENTATIVES

EASTERN APPLIANCE COMPANY
Boston, Massachusetts

WALDO S. HULL
163 W. Queen Lane
Philadelphia, Pennsylvania

Reynolds Gas Regulator Co.
ANDERSON, INDIANA, U. S. A.

GAS CONTROL SINCE 1892

Chester J. McMahan

Chester J. McMahan, superintendent of production, Pittsburgh group of Columbia Gas System, died May 9, at his residence in Washington, Pa. He was at the age of 60 and had been employed more than 40 years by Columbia Gas System companies.

Mr. McMahan started work with The Manufacturers Light and Heat Company in 1911, on production and transmission work at Washington. In 1928 he was made a division superintendent and was stationed at Brookville, Pa. In 1930, Columbia's Pittsburgh Group made him assistant superintendent of production; in 1934, superintendent of production.

Jack Upp, Jr.

Jack Upp, Jr. passed away April 27 at his home in Lexington, Kentucky. For the past three years Mr. Upp represented United Petroleum Gas Company in Kentucky, Ohio, Indiana and Michigan.

Courtesy . . . for Landowner in Right-of-Way Work

(Continued from page 17)

sire to cooperate and work with the right-of-way agent assigned to the construction spread so that he will have as much help as possible in handling a job that requires a lot of diplomacy.

The importance to the pipeline company of the long-term view was expressed in Mr. Putnam's closing comments.

"The uninformed think that once a pipeline is in the ground that's the end of it and the pipeline company will have little or no further dealings along the line," he said.

"That, of course, is not the case, for when a pipeline is laid it almost invariably develops that some additional cleanup or other maintenance problems will throw company representatives in direct contact with the landowner again. The company is also actually a substantial purchaser of power and materials from local concerns. The people along the lines will ultimately come to realize this, and it lays a good foundation as the initial relations of the right-of-way men with landowners in new areas. It is extremely important, in these initial negotiations, that both the pipeline company and its employees are conscious of and respectful of the rights of the owners."

Steam Turbines in Compressor Stations

(Continued from page 24)

cheaper than a gas engine station by some $45.00 per installed horsepower. The saving in construction was due largely to the elimination of the massive foundations and to simplified piping, as well as to smaller buildings and general plant.

"In addition to construction costs, our operating costs for the steam stations have been less than for the gas engine stations. The following comparisons show operating costs on both a horsepower hour and an Mcf basis:

	Steam Station (¢ per hphr)	*Reciprocating Station* (¢ per hphr)
Labor	.0584	.0788
Expense	.0143	.0218
Lube oil	.0015	.0166
Fuel	.0872	.0688
Total	.1614	.1860

	Steam Station (¢ per Mcf)	*Reciprocating Station* (¢ per Mcf)
Labor	.03503	.04842
Expense	.00859	.01340
Lube oil	.00088	.01019
Fuel	.05234	.04230
Total	.09684	.11431

"As the comparisons show, the steam station is more economical to operate than the reciprocating station. The added fuel cost of the steam station is outweighed by the savings in labor and lube oil. The labor costs are less because it takes fewer men to run the steam plant."

T. D. Cartledge is New Linde President

Thomas D. Cartledge has been appointed president of Linde Air Products Company, a division of Union Carbide and Carbon Corporation.

The Reliable Shut-Off for Street Mains

THE GOODMAN STOPPER

Now has the "Z" handle for easy manipulation. When locked in place it holds. Stopper cannot slip. Gas cannot pass. Adjusted in 30 seconds.

Ask for circulars on this and other distribution equipment.

Nearly a half century of service to the Gas Industry.

Safety Gas Main Stopper Co.
523 Atlantic Avenue, Brooklyn, New York

A Complete
MAIN TREATMENT SERVICE

Prepare for Natural Gas

GPM PRODUCTS

"FLUSHALL" – Dust Removal

"SOLVALL" – Liquid Phase Gum

"SEALALL" – Joint Sealing

"WETALL" – Dust Laying

"FOGALL H" – Hot Fogging

"FOGALL C" – Cold Fogging

"IRON HYDROXIDE" – Purification

Discuss your problems with our engineers

GAS PURIFYING MATERIALS CO.
3-15 26th Ave.,
Long Island City, N. Y.

NEW BULLETINS

ARMORED FLOWRATOR METERS. The measurement and control of flow rates in high pressure fluids are the subject of this bulletin. It is applicable to liquids or gases. Specifications and selection information for low-to-high pressure instruments are included with adequate illustrations. *Bulletin 40.* 12 pp. Fischer & Porter Co., Hatboro, Pa.

DOUBLE SEATED DIAPHRAGM REGULATING VALVES. This leaflet describes a new regulating valve designed for use in the process industries. The valve is fully illustrated in sectional drawings; operation and construction characteristics are described clearly. Dimensional and pressure tables facilitate selection. *Bulletin 513.* 4 pp. Leslie Co., Lyndhurst, N. J.

ALNOR PYROTAC AUTOMATIC PROTECTION. This instrument is designed to provide excess temperature cut-out at pre-determined points as a safety feature in heating operations. The bulletin shows how the instrument works and its construction. Typical applications include varnish firing, chemical processing and furnaces generally. Specification data for selection are included. *Bulletin 4703.* 8 pp. Illinois Testing Laboratories, Inc., 432 N. LaSalle St., Chicago 10.

25 YEARS WITH SELAS CELEBRATED AT DINNER FOR HESS

Frederic O. Hess, president, Selas Corporation of America, was the guest of honor at a dinner and entertainment celebrating the twenty-fifth anniversary of his association with the corporation.

Approximately 300 employees and friends attended the dinner, in late April.

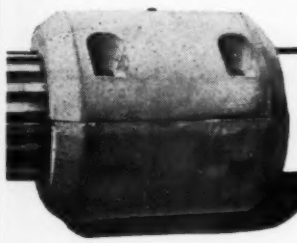
In recognition of the event, employees of Selas Corporation of America presented Mr. Hess with a silver coffee service and a matched set of aluminum luggage.

Congratulatory messages from a great number of gas industry executives and executives of other industrial firms utilizing gas equipment were read to Mr. Hess and the dinner guests.

TexGasTrans Files for $11-Million Increase

Texas Gas Transmission Corporation asked Federal Power Commission for authority to raise its wholesale natural gas rates by approximately $11-million to offset the greatly increased costs of doing business. The increase would be effective July 1, 1952.

The company said current rates, which have not risen for ten years, are not now sufficient to cover present or anticipated costs of service. The increase would be apportioned among utility customers of Texas Gas in an eight-state area from Louisiana to Ohio.



UNIVERSAL RIVER WEIGHTS

safeguard **Tennessee Crossing**

Tides, floods, currents and shifting sands cause lines crossing bodies of water to "buoy-up," move laterally, even spring leaks. Texas Gas Transmission Corp. of Owensboro, Ky., safeguards against such events by installing Universal River Weights on two of their lines crossing the Tennessee River. They found it the economical way to add necessary weight.

write *for the complete story of the Tennessee Crossing and additional information on River Weights and sizes available.*

Photo shows how pipe line is "floated" across river.

Plants in: Decatur and Dothan, Alabama; Tampa and Ocala, Florida; Atlanta, Georgia; Kenvil, New Jersey; Binghamton, Port Washington, Rochester and Syracuse, New York; Columbus and Zanesville, Ohio; Norristown and Pittsburgh, Pennsylvania; Nashville, Tennessee; Clarksburg and New Martinsville, West Virginia.

Universal
CONCRETE PIPE CO.
General Offices: 297 South High St., Columbus, Ohio

LOWEST COST PIPE INSTALLATION...

Send COUPON Today!

Hydrauger Corp., Ltd.
681 Market St., San Francisco, Calif.
Please send, without obligation to me, the HYDRAUGER BOOKLET which shows relative costs and speeds of BORING as well as specifications of various Hydrauger models.

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2" to 24" BORES · Up to 250' long.

HYDRAUGER*

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UNDER STREETS
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OPEN HOLE

HY-25A

*Earth Boring Tool

AVOIDS EXCESSIVE TRENCHING

Hydrauger bored holes for pipe installation invariably reduce costs 80% to 90% by eliminating trenching and back-filling to say nothing of man-hour labor savings and safety to highway traffic.

HYDRAUGER CORP. Ltd.
681 Market Street
San Francisco, California

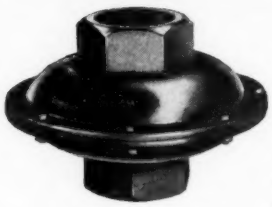
IRON SPONGE

for high efficiency gas purification at high pressures

Iron Sponge is your key to sulfur-free gas at minimum processing cost. Iron Sponge has high efficiency at low pressures or at today's high pressures and high temperatures. It absorbs *more* H_2S, gives long service between foulings, and is easily regenerated. Investigate it for your purification problem today!

CONNELLY, Inc.

3154 S. California Ave., Chicago 8, Illinois
Elizabeth, N. J. • Los Angeles, California



VERTICAL TYPE SHOWN

Eliminate Air In Gas Lines With

NORWALK DIAPHRAGM TYPE CHECK VALVES

Vertical Type in Sizes ⅜" thru 6"
Horizontal Type in Sizes ½" thru 6"

Norwalk Diaphragm Type Check Valves, both Vertical and Horizontal, provide positive check against reverse flow of either gas or air. Rugged construction will stand back pressures to 50 lbs. Soft seat disc will seat freely when gas flows in desired direction or will seat tightly on equalised or back pressure. Valves for higher pressures supplied on special order.

NORWALK VALVE COMPANY
South Norwalk, Conn.

M-SCOPE Pipe Finder

LIGHTWEIGHT MODEL
One Man Operation On Every Application

HIGHLY EFFICIENT

IMMEDIATE SHIPMENT

Free Demonstration and Operating Instructions

Catalog No. 25M On Request

JOSEPH G. POLLARD CO., INC.
Pipe Line Equipment
New Hyde Park **New York**

ENGINEERING · REPORTS · VALUATIONS
DESIGN CONSTRUCTION

- Our trained and experienced crews are ready for immediate service in any section of the country to engineer and install commercial and industrial gas burning equipment.
- Specialists in natural gas, manufactured gas, oil gas, L-P gas, gas transmission lines and distribution systems. Expert witnesses. Reports on economics and for financing. Rate studies.
- Steel mill, coal, by product coke and chemical coke problems.

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30 VESEY STREET, NEW YORK 7, N. Y.
Worth 2-5120

Erick Larson—Walker W. Stevenson,
New York State licensed professional engineers

NEW BOOKS

NORTH AMERICAN COMBUSTION HANDBOOK. A Basic Reference on the Art and Science of Industrial Heating with Gaseous and Liquid Fuels.

The editors of this compilation are to be complimented on their presentation of "a basic explanation of the theory of combustion; outlines for combustion, heat transfer, and fluid flow calculations; charts and data to simplify and speed these calculations; and a discussion of combustion equipment, its selection and operation." From our viewpoint, it should prove to be valuable to engineers and users of industrial combustion equipment, and to engineering students who are considering specialized careers in the field of combustion.

The book has drawn from a great number of voluminous works in the field of combustion for charts and tables, with adequate reference to those works, but includes original discussion of the subjects in a manner that encourages reading and materially assists in ready-understanding.

The seven chapters consider the elements of combustion, fuels, combustion analysis, heat transfer, flow of fluids, burner equipment, combustion control, combustion systems. Each chapter is clearly subdivided to provide for subconsiderations of the main subjects. An appendix of 48 pages supplies a vast range of applicable data. Standard abbreviations and symbols used in combustion engineering and extensive glossary are included. There is an excellent index.

Not easily satisfied in the matter of book manufacturing, it is a pleasure for us to regard the excellence of the typography, printing quality, paper and binding of this volume.

While it must have been prepared with its promotional potentials in mind, a fine professional presentation of information and data is maintained throughout.

Pp. 322 + xviii. 178 tables, charts and illustrations. The North American Manufacturing Co., 4455 East 71 St., Cleveland 5, O. $2.00 + postage.

THE PETROLEUM DICTIONARY. By Lalia Phipps Boone.

Again, with the close relationship of oil and gas at the field level, a "petroleum book" has strong gas industry implications.

This is the most extensive work of its kind. It has approximately 6,000 entries, including the colorful terminologies of the roustabouts, toolies, swivel necks and derrick monkeys; as well as the more precise terms of chemistry, physics and geology.

A truly professional approach was maintained by the compiler in gathering, verifying, editing and arranging her dictionary, which was encouraged and assisted by the interest of a great number of persons at all levels of the producing industry. Also, the grant of American Council of Learned Societies assisted in making possible the field work of the project.

Part one is an interesting presentation of the origins, development and characteristics of the field language. Part two is the dictionary, followed by a bibliography.

Pp. 338 + xiv. University of Oklahoma Press, Norman, Okla. $5.00.

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Step Up Sales Tempo, Eastern Group Told

THE growing necessity for increased selling effort on the part of the gas utility and the gas appliance industries was the dominant theme of all the speakers who addressed the eastern natural gas sales conference of the American Gas Association in Pittsburgh.

Manufacturers representing every type of domestic gas equipment were heard from on the two day program, which included discussions on markets and marketing of gas ranges, refrigerators, water heaters, laundry dryers and incinerators.

These are normal times

Lee Corn

Lee Corn, sales manager, The East Ohio Gas Company, acted as chairman of the conference. In his opening observations he warned the delegates of the futility of waiting for normal times before stepping up the tempo of selling efforts. "These are normal times, and will remain so for as long as we operate in a guns and butter economy," he said.

Gas industry's Tower of Babel

Spokesman for gas range manufacturers, Julius Klein, president, Caloric Stove Corp., showed that the electric industry is selling beauty, leisure and comfort in electric cooking, with price only a secondary consideration. The average retail price of all electric ranges sold in 1951 was $245, as compared to $158 for gas ranges.

Julius Klein

Scoring what he characterized as the Tower of Babel in gas slogans, the speaker listed among others: Gas Has Got It, Naturally its Gas, The Trend is to Gas, The Swing to Gas, Ride the Gas Line, The Magic Fuel. He said "We have got to chart ourselves a promotion program and stick to it. We are pulling in too many directions at the same time. The electric people say 'Of Course it's Electric' and and they keep on saying it."

Mr. Klein also gave the assemblage a preview of the "Matchless Cooking" campaign, which had just been inaugurated by The Philadelphia Gas Works.

There's gas load in clothes dryers

Judson S. Sayre, general manager, Bendix Home Appliance, Inc., characterized the gas fired laundry dryer as the coming giant of the home appliance industry. He predicted a market of over six million units in the next five years. In the past year the sale of electric dryers has risen only 45 per cent; gas dryer sales are up 102 per cent. The gas dryer in a home represents a new load of 500 to 1,000 cubic feet per month, he said.

Hot or cold on water heaters?

J. F. Donnelly

The year 1948 was the first year the water heater industry spent more than a million dollars in advertising, according to James F. Donnelly, assistant general manager, A. O. Smith Corp. The tangible result of this investment, totaling $1,600,000 was the sale of 2,346,000 automatic water heaters in 1949. Charging that the industry has blown hot and cold in water heater promotion, he urged a continuing national advertising program in which manufacturers, utilities, dealers and the gas associations all would participate, setting aside a fixed percentage of anticipated water heater dollar volume for that purpose.

PAR fits in the sales plan

W. H. Ligon

Extolling AGA's PAR plan, Wister H. Ligon urged a three point "Sound off for Sales" program embracing (1) organization for effective action, (2) dramatizing gas service and (3) capitalizing on the PAR program. To accomplish the last point, the speaker outlined the various AGA sales aids, with particular reference to the kits now available, that are designed to stimulate dealer activity and sales.

Television, as a medium with many unrealized possibilities for the gas industry, was presented by Hendrik Boor-aem, McCann-Erickson, Inc., the national advertising agency that handles the AGA account.

Want the load in gas refrigerators?

D. K. Patterson

David K. Patterson, sales promotion manager, Servel, Inc., declared it to be squarely up to the gas industry whether it wants to retain and build a gas refrigeration load. Three million gas refrigerators now in operation are bringing $40 million in annual revenue. If the refrigerator load goes by default, the gas industry is in grave danger of losing the entire kitchen load, he said.

The speaker advocated that utilities reestablish their merchandising leadership.

"Don't leave a vacuum in the gas kitchen business, by selling the gas refrigerator short," Mr. Patterson warned.

Company ups incinerator sales 1700%

A highly profitable load awaits development of the gas incinerator business, John McElwain, The Peoples Natural Gas Company, told the AGA conference. The average gas-fired incinerator uses about 1.5 Mcf per month and the average revenue added is between $10.00 and $12.00 per year per customer, he stated. Mr. McElwain pointed to the record of The East Ohio Gas Company. Dealers in this company's territory sold only 450 incinerators in 1949; in 1950, they sold 2,000, and in 1951 more than 8,000.

Panel on dealer problems

A panel discussion, devoted to dealer problems was titled, "Pattern for Profit." Led by W. D. Williams, Public Service Electric and Gas Company, N. J., the panel consisted of: Joseph G. Berwanger, The Ohio Fuel Gas Company; Edward W. Hodgetts, The Cincinnati Gas and Electric Company; Mary E. Huck, The Ohio Fuel Gas Company; and Irving R. Jensen, The Peoples Gas Light and Coke Company of Chicago.